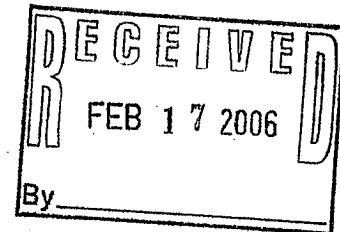


PSD & HRA AIR QUALITY MODELING REPORT

BLUE LAKE ULTRAPOWER 3

GENERATING STATION



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~~FILE~~ "Air Quality
Modeling
Report"

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LIST OF ACRONYMS

| | |
|--------------------|---|
| AAQS | Ambient Air Quality Standards |
| ANC | Acid Neutralizing Capacity |
| AP-42 | USEPA, <u>Compilation of Air Pollutant Emission Factors</u> , AP-42, Fifth Edition, January 1995, Supplements A through E, September 2005 |
| AQIA | Air Quality Impact Analysis |
| AQRV | Air Quality Related Values |
| AQMD | North Coast Unified Air Quality Management District |
| biomass | Wood Chips |
| BlueScape | BlueScape Environmental |
| BPIP | Building Profile Input Program |
| CAAQS | California Ambient Air Quality Standards |
| CARB | California Air Resources Board |
| CFR | Code of Federal Regulations |
| CO | Carbon Monoxide |
| DEM | USGS Digital Elevation Model |
| FLAG | Federal Land Managers Air Quality Related Workgroup |
| ESP | Electrostatic Precipitator |
| Generating Station | Blue Lake Ultrapower 3 Generating Station |
| GEP | Good Engineering Practice |
| gpm | Gallons Per Minute |
| HARP | Hotspots Analysis and Reporting Program |
| hp | Horsepower |
| HRA | Health Risk Assessment |
| IC | Internal Combustion |
| ISCST3 | Industrial Source Complex Short Term Version 3 – USEPA Modeling Software |
| km | Kilometers |
| kW | Kilowatt |
| kVA | One thousand Volt Amperes |
| LAC | Limits of Acceptable Charge |
| MMBtu/hr | Million British Thermal Unit per hour |
| MW | Megawatt |
| NAAQS | National Ambient Air Quality Standards |
| NAD83 | North American Datum 1983 |
| NCAQMD | North Coast Unified Air Quality Management District |
| NPS | National Park Service |
| NO | Nitrogen monoxide |
| NO _x | Nitrogen Oxides |
| NO ₂ | Nitrogen Dioxide |
| O ₃ | Ozone |
| OAR | Oregon Administrative Rules |
| OEHHA | California Office of Environmental Health Hazard Assessment |

LIST OF ACRONYMS - Continued

| | |
|------------------|---|
| OLM | Ozone Limiting Method |
| PM | Particulate Matter |
| PM ₁₀ | Particulate Matter with aerodynamic diameter less than 10 microns |
| PSD | Prevention of Significant Deterioration |
| PTE | Potential to Emit |
| ROI | Range of Influence |
| SCS | SCS Engineers |
| SER | Significant Emission Rates |
| SIA | Significant Impact Area |
| SIL | Significant Impact Level |
| SO _x | Sulfur Oxides |
| tpy | Tons Per Year |
| USDAFS | United States Department of Agriculture Forest Service |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| UTM | Universal Transverse Mercator |
| VOC | Volatile Organic Compounds |

1.0 EXECUTIVE SUMMARY

The Blue Lake Ultrapower 3 Generating Station (Generating Station), located in the town of Blue Lake in Humboldt County, California, is owned and operated by Ultrapower 3, a subsidiary of North American Power Group. Until April 1999, this 13.1 megawatt (MW) biomass electrical generation facility used wood chips (biomass) to provide heat to a Zurn Corporation Boiler. In April 2005, the North Coast Unified Air Quality Management District (AQMD) filed a petition for revocation of AQMD Permit No. NS-071 and Title V Permit No. NCFU 097-12. For the past six years (1999 – 2005), the facility has not been in operation. In order to resume function at this facility, a Stipulated Order requires that Ultrapower 3 must submit a new permit application for the AQMD Permit to Operate, and the United States Environmental Protection Agency (USEPA) Title V Permit.

To satisfy the Stipulated Order, Ultrapower 3 must conduct Air Quality Impact Analysis (AQIA) modeling, Prevention of Significant Deterioration (PSD) modeling and a Health Risk Assessment (HRA) for the Generating Station. On behalf of Ultrapower 3, SCS Engineers (SCS) and BlueScape Environmental (BlueScape) have conducted these analyses and prepared this report for submittal to the AQMD. The AQIA and PSD modeling are based on the facility's potential-to-emit (PTE) of the following regulated air pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter less than 10 μm in diameter (PM₁₀) and sulfur oxides (SO_x). The Generating Station's carbon monoxide (CO) emissions exceed the threshold triggering PSD modeling. In addition, Generating Station's oxides of nitrogen (NO_x) and Particulate Matter with aerodynamic diameter less than 10 microns (PM₁₀) exceed the significant emission increase threshold and must be included in the PSD modeling.

Modeling was conducted in accordance with the Modeling Protocol prepared by SCS and BlueScape Environmental (BlueScape) dated December 20, 2005, except as noted herein. The USEPA's *Guideline on Air Quality Models*, 40 CFR Part 51 Appendix W (July 1, 2003) was consulted for guidance to develop the Modeling Protocol. The Modeling Protocol is included in this report in Appendix A, *Modeling Protocol Dated December 20, 2005*. The Modeling Protocol was submitted to the AQMD on December 21, 2005. Due to time constraints the AQMD has not completed a formal review of the modeling protocol; however, comments received so far have been addressed. These comments have included a request for clarification of the basis for boiler criteria emission factors (footnotes on emission spreadsheet revised), verbal approval for use of the ISCST3 air dispersion model, and assistance in compiling emission rates and parameters for nearby sources (included in increment analysis).

Criteria pollutant modeling was conducted using Lakes Environmental Software, ISC-AERMOD View (version 5.1). This software incorporates USEPA's Industrial Source Complex Short Term 3 (ISCST3) (version 02035) air dispersion model. Five years of hourly meteorological data, from the Blue Lake Rancheria meteorological station (2000-2004), were input to the model.

Criteria pollutant modeling results were compared with Significant Impact Levels (SIL). CO did not exceed the SIL. A full impact study was completed for NO₂ and PM₁₀ within the calculated Significant Impact Area (SIA).

Table 1-1. Generating Station Significant Impact Area Air Dispersion Model Results

| Pollutant | Averaging Period | Facility Peak Modeled Concentration ($\mu\text{g}/\text{m}^3$) | Significant Impact Level ($\mu\text{g}/\text{m}^3$) | SIL Exceeded? | Maximum Distance to Receptor Exceeding SIL (km) |
|------------------|------------------|--|---|---------------|---|
| CO | 1-Hour | 842.4 | 2,000 | No | None |
| CO | 8-Hour | 386.9 | 500 | No | None |
| NO ₂ | 1-Hour | 2,798 (459.0) ¹ | 19 | Yes | 0.97 |
| NO ₂ | Annual | 4.528 (3.396) ¹ | 1.0 | Yes | 8.52 |
| PM ₁₀ | 24-Hour | 8.064 | 5.0 | Yes | 3.12 |
| PM ₁₀ | Annual | 1.148 | 1.0 | Yes | 3.03 |

¹ NO₂ results are ozone limited.

Background ambient air monitoring data was available at Blue Lake Rancheria for PM₁₀ and at Ukiah for other pollutants. Model results did not exceed the PSD monitoring threshold.

Table 1-2. PSD Monitoring Exemption Thresholds

| Pollutant | Averaging Period | Facility Peak Modeled Concentration ($\mu\text{g}/\text{m}^3$) | PSD Monitoring Exemption Threshold ($\mu\text{g}/\text{m}^3$) | Threshold Exceeded? |
|------------------|------------------|--|---|---------------------|
| CO | 8-Hour | 386.9 | 575 | No |
| NO ₂ | Annual | 4.528 (3.396) ¹ | 14 | No |
| PM ₁₀ | 24-Hour | 8.064 | 10 | No |

¹ NO₂ results are ozone limited.

The background air quality was added to the maximum predicted model results for comparison with ambient air quality standards. For the California Ambient Air Quality Standards (CAAQS) analysis, modeling results complied with the CAAQS, except for 24 hour PM₁₀ for which background already exceeds the state standard. For the National Ambient Air Quality Standards (NAAQS) analysis, modeling results complied with NAAQS.

Table 1-3. Compliance with California and National Ambient Air Quality Standards

| Pollutant | Averaging Period | Facility Modeled Conc. ($\mu\text{g}/\text{m}^3$) | Background ($\mu\text{g}/\text{m}^3$) | Total ($\mu\text{g}/\text{m}^3$) | AAQS ($\mu\text{g}/\text{m}^3$) | Standard Exceeded ? |
|----------------------------------|------------------|---|---|------------------------------------|-----------------------------------|---------------------|
| <i>State Standards</i> | | | | | | |
| CO | 1-Hour | 842.4 | 5,513 | 6,355 | 23,000 | No |
| CO | 8-Hour | 386.9 | 2,929 | 3,316 | 10,000 | No |
| NO ₂ | 1-Hour | 2,798 (445.8) ¹ | 79.2 (13.2) ¹ | 2,877 (459.0) ¹ | 470 | No |
| PM ₁₀ | 24-Hour | 8.064 | 57.6 | 65.7 | 50 | Yes |
| PM ₁₀ | Annual | 1.148 | 17.7 | 18.8 | 20 | No |
| <i>National Standards</i> | | | | | | |
| CO | 1-Hour | 842.1 | 5,513 | 6,355 | 40,000 | No |
| CO | 8-Hour | 386.8 | 2,355 | 2,742 | 10,000 | No |
| NO ₂ | Annual | 4.528 (3.396) ² | 18.9 | 23.4 (22.3) ² | 100 | No |
| PM ₁₀ | 24-Hour | 5.313 | 46.5 | 51.8 | 150 | No |
| PM ₁₀ | Annual | 1.043 | 12.5 | 13.5 | 50 | No |

¹ NO₂ results are ozone limited.

² Annual NO₂ results reduced by Ozone Limiting default factor of 0.75.

For the PSD increment analysis, emissions information for nearby facilities that might have an air quality impact within the Generating Station's Significant Impact Area (SIA) was obtained from AQMD. The combined emissions from the Generating Station and nearby sources were compared with the AQMD PSD allowable increments. The concentrations were below the allowable increments.

Table 1-4. PSD Increment Air Dispersion Model Results

| Pollutant | Averaging Period | Facility & Nearby Sources Modeled Concentration ($\mu\text{g}/\text{m}^3$) | Facility Contribution ($\mu\text{g}/\text{m}^3$) | PSD Increment ($\mu\text{g}/\text{m}^3$) | Increment Exceeded? |
|------------------|------------------|--|--|--|---------------------|
| NO ₂ | Annual | 31.449 (23.588) ¹ | 0.337 (0.253) ¹ | 25 | No |
| PM ₁₀ | 24-Hour | 10.412 | 2.316 | 30 | No |
| PM ₁₀ | Annual | 2.389 | 0.252 | 17 | No |

¹ NO₂ results are ozone limited.

Class I impacts were assessed for Redwood National Park using a VISCREEN Level-2 visibility screening analysis and air dispersion modeling for pollutant concentrations. Air Quality Related Values (AQRV) and Limits of Acceptable Change (LAC) complied with all National Park Service requirements.

The HRA is based on the facility's PTE for pollutants assigned health risk factors by the California Office of Environmental Health Hazard Assessment (OEHHA). The Health Risk Assessment (HRA) demonstrated maximum individual cancer risk, chronic noncancer hazard index, and acute noncancer hazard index below all applicable significance thresholds.

Table 1-5. Health Risk Assessment Results

| Location | Health Risk | Result | Significance Threshold | Threshold Exceeded? |
|---------------|-------------------|---------------------|------------------------|---------------------|
| Max Worker | Cancer | 5.08 in one million | 10 in one million | No |
| Max Residence | Cancer | 1.50 in one million | 10 in one million | No |
| Max Offsite | Chronic Noncancer | 0.148 Hazard Index | 1.0 | No |
| Max Offsite | Acute Noncancer | 0.147 Hazard Index | 1.0 | No |

2.0 PROJECT INFORMATION

2.1 Site Description

The Generating Station is located at 200 Taylor Way, Blue Lake, California in Humboldt County. The area immediately surrounding the facility is an industrial park, within a small rural town. Beyond Blue Lake are low density rural and unpopulated areas. The nearest population center is Arcata, located about six kilometers (km) to the west of the facility. Eureka is located approximately 13 km to the southwest. The Pacific Ocean is located, at nearest, about 10.5 km due west of the Generating Station. Redwood National Park is located 22 km to the north. A regional map is shown in Figure 1, and an aerial photograph of the site location is shown in Figure 2.

2.1 Project Description

The Generating Station utilizes wood combustion and steam production to generate electricity. Wood chips, acting as the fuel, are input to the 185 million british thermal unit per hour (MMBtu/hr) Zurn Corporation Boiler (maximum heat input). The boiler converts water into steam from the heat generated through combustion at a rate of 105,000 pounds steam per hour. An ash reburn chamber burns carbon contained in ash from the boiler dropout, which reduces particulate matter (PM) emissions. Boiler exhaust gas is used to dry the wood fuel prior to being feed into the boiler. The facility uses an 80 MMBtu/hr propane burner during startups, shutdowns and periods of combustion instability, limited by permit to 1.78 million gallons of propane per year.

Other emission sources are a cooling tower with a 7,700 gallons per minute (gpm) circulating water flow rate, 250 kilowatt (kW) diesel-fired emergency generator, and a 125 horsepower (hp) diesel-fired emergency boiler water pump. Operation of the diesel engines was assumed limited to 30 minutes per day and 20 hours per year for maintenance and testing purposes in accordance with requirements of the California Air Toxic Control Measure for Stationary Diesel Engines.

Pollution control for PM is provided by a 21,002 square foot electrostatic precipitator (ESP) with a rating of 85 one thousand Volt Amperes (kVA). The wood-fired boiler and propane burner exhaust through this control device. PM control is assumed to be 98%.

Figure 1. Blue Lake Ultrapower 3 Generating Station Regional Map

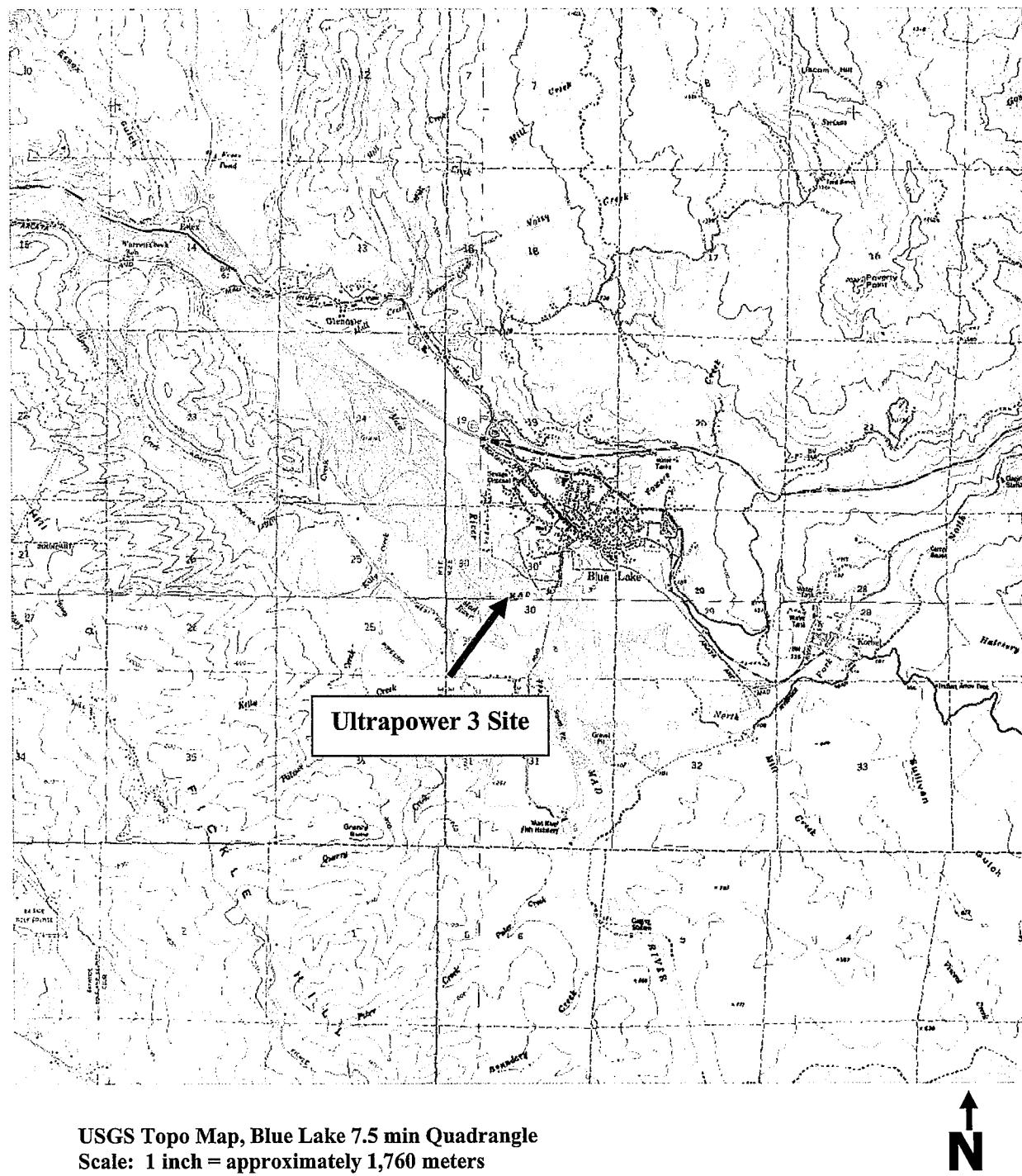


Figure 2. Blue Lake Ultrapower 3 Generating Station Aerial Photograph



GlobeXplorer™

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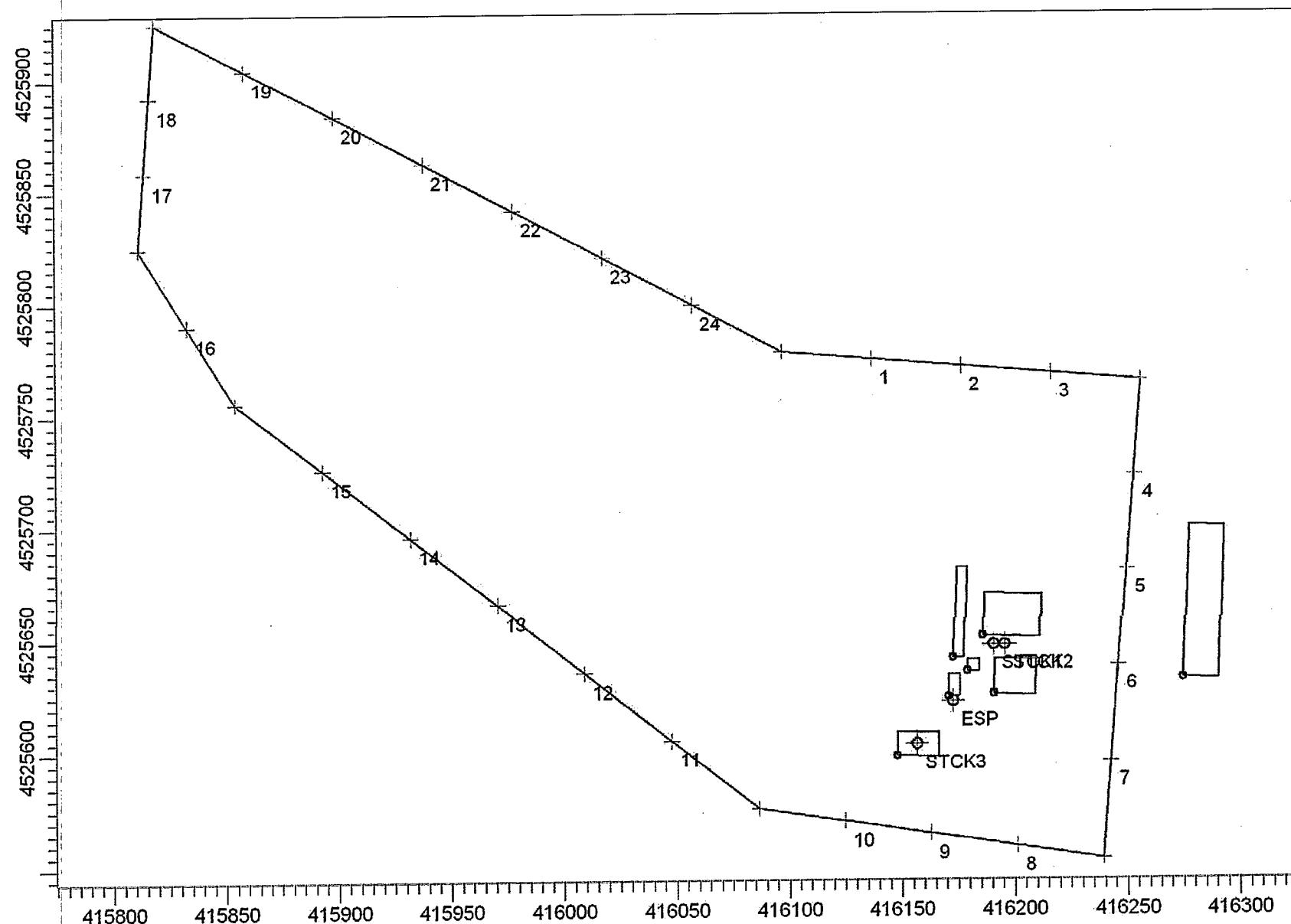
150

300 Meters

7

N

Figure 3. Blue Lake Ultrapower 3 Generating Station Facility Site Plan



The modeling analysis includes emissions from the stacks listed in Table 2-1. Each stack is modeled as a point source.

Table 2-1. Equipment Operating Conditions

| Parameter | ESP Stack | Diesel Emergency Generator | Diesel Boiler Water Pump | Cooling Tower |
|----------------------------------|--------------------------|----------------------------|--------------------------|--------------------------|
| Stack Coordinates NAD83 (UTM km) | 416.173 E, 4525.622 N | 416.191 E, 4525.647 N | 416.196 E, 4525.647 N | 416.157 E, 4525.603 N |
| Grade Elevation at Stack (m) | 24.38 | 24.38 | 24.38 | 24.38 |
| Stack Height Above Grade (m) | 30.48 | 4.17 | 3.73 | 7.77 |
| Stack Diameter (m) | 1.52 | 0.18 | 0.08 | 8.45 ¹ |
| Stack Gas Exit Velocity (m/s) | 15.65 | 32.74 ² | 66.42 ² | 10 ³ |
| Stack Gas Temperature (K) | 388.7 | 622 ² | 622 ² | 293 ³ |

¹ Effective diameter for three stacks of 4.88 m diameter each

² Typical values based on 5.138 acfm/hp and 622K exhaust (CARB, Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines, October 2000, Appendix 2).

³ Typical values.

3.0 GENERATING STATION CRITERIA POLLUTANT EMISSIONS

Criteria pollutant emissions of CO, NO_x, PM₁₀ and SO_x are summarized in Table 3-1, with emission calculations attached as Appendix B. Emissions of volatile organic compounds (VOC) are not included in Table 3-1 since AQIA and PSD modeling is not required for VOCs.

Table 3-1. Criteria Pollutant Emissions

| Device | CO (tpy) | NO _x (tpy) | PM ₁₀ (tpy) | SO _x (tpy) |
|--------------------------------------|-------------|--------------------------|---------------------------|--------------------------|
| Boiler – Wood Combustion | 810.30 | 121.55 | 32.41 | 20.26 |
| Boiler – Propane Combustion | 2.85 | 16.91 | 0.53 | 0.02 |
| Emergency Boiler Water Pump – Diesel | 0.004 | 0.019 | < 0.01 | < 0.01 |
| Emergency Generator – Diesel | 0.011 | 0.052 | < 0.01 | < 0.01 |
| Cooling Tower | - | - | 1.94 | - |
| Total | 813.17 | 138.53 | 34.89 | 20.29 |

3.1 PSD and AQIA Applicability

The Blue Lake Generating Station has potential CO emissions greater than the PSD threshold of 250 tons per year (tpy). Therefore, PSD review is assumed to be triggered.

Facility emissions of CO, NO_x and PM₁₀ exceed the significant emission rate under 40 CFR 52.21. Therefore, a PSD air quality impact study was performed for CO, NO_x and PM₁₀. The

SO_X emissions are less than the significant emission rates, and thus, were not considered in this PSD modeling study. PSD and AQIA applicability are shown in Table 3-2.

Table 3-2. PSD and AQIA Applicability

| Pollutant | Generating Station Facility PTE | PSD Threshold | | AQIA Threshold | |
|------------------|---------------------------------|---------------|-------------|----------------|-------------|
| | (tpy) | (tpy) | Applicable? | (tpy) | Applicable? |
| CO | 813.17 | 250 | Yes | 100 | Yes |
| NO _X | 138.53 | 250 | No | 40 | Yes |
| PM ₁₀ | 34.89 | 250 | No | 15 | Yes |
| SO _X | 20.29 | 250 | No | 40 | No |

4.0 PSD AND AQIA AIR DISPERSION MODELING

This section describes the methodology that was followed to complete the PSD air dispersion modeling analysis, including the Significant Impact Analysis (SIA), and the full impact study.

4.1 Air Dispersion Model Selection

Modeling was performed with the USEPA-approved Industrial Source Complex Short Term, Version 3 model (ISCST3 version 02035) using the Lakes Environmental software interface (Version 5.1). ISCST3 is a sequential model that calculates concentrations at each receptor for every hour in the year. The ISCST3 model requires various model inputs. These inputs were developed as appropriate for the project location, and in accordance with the USEPA modeling guidance.

4.2 Model Inputs

This section describes the ISCST3 model inputs that were used for the SIA analysis, the NAAQS and CAAQS compliance analysis and the PSD increment consumption analysis.

Dispersion modeling was conducted to demonstrate:

1. Compliance with Class II Ambient Air Quality Standards (AAQS) for CO, NO_X and PM₁₀.
2. Compliance with PSD increment consumption analysis for NO_X and PM₁₀.

4.2.1 ISCST3 Settings

ISCST3 was run in the regulatory default mode, including stack-tip downwash and buoyancy-induced dispersion. Rural dispersion coefficients were used, consistent with the Auer land use analysis (based on a review of aerial photographs).

4.2.2 Pollutants Modeled

Maximum CO, NO₂ and PM₁₀ impacts were modeled. CO was modeled for the one-Hour and eight-Hour averaging periods. NO_x was modeled for the one-Hour and annual averaging periods, with adjustments made to calculate NO₂ impacts. PM₁₀ was modeled for 24-Hour and annual averaging periods. Table 4-1 lists the emission rates that were entered into the model for each source.

Table 4-1. Summary of Generating Station Plant ISCST3 Model Input Emission Rates

| Pollutant | Boiler | | Emergency Boiler Water Pump | | Emergency Generator | | Cooling Tower | |
|------------------|-----------------------|----------------------|-----------------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|
| | Max. Short Term (g/s) | Annual Average (g/s) | Max. Short Term (g/s) | Annual Average (g/s) | Max. Short Term (g/s) | Annual Average (g/s) | Max Short Term (g/s) | Annual Average (g/s) |
| CO | 23.668 | - | 0.0526 | - | 0.141 | - | - | - |
| NO _X | 5.624 | 3.983 | 0.244 | 0.0011 | 0.655 | 0.003 | - | - |
| PM ₁₀ | 0.999 | 0.947 | 0.0007 | 0.0001 | 0.002 | 0.0002 | 0.056 | 0.056 |

4.2.3 Source Parameters

The modeling analysis includes emissions from a boiler (ESP Stack), diesel-fired emergency generator, a diesel-fired emergency boiler water pump and a cooling tower. Each source was modeled as a point source. The ISCST3 source parameters for modeling, including base elevation, height, exit gas velocity, diameter, gas temperature and stack orientation are provided in Table 2-1.

4.2.4 Structures and Building Downwash

ISCST3 has the capability to account for building downwash produced by airflow over and around structures. Direction-specific building downwash parameters were developed for input to ISCST3 using the USEPA Building Profile Input Program (BPIP). At 100 feet high, the boiler ESP stack height complies with Good Engineering Practice (GEP) guidelines (65 meter height limit). Buildings were entered in ISCST3 if the distance from the building to any of the shorter stacks (diesel engines or cooling tower) is less than five times the lesser of the building height or projected width.

4.2.5 Terrain Data

The ISCST3 model requires receptor elevations to calculate impacts in simple terrain above the stack base and in complex terrain above the stack height. Receptor elevations were developed using 7.5-minute Digital Elevation Maps (DEM) data in the North American Datum 1983 (NAD83) coordinate system with 10 m spacing.

4.2.6 Receptor Data

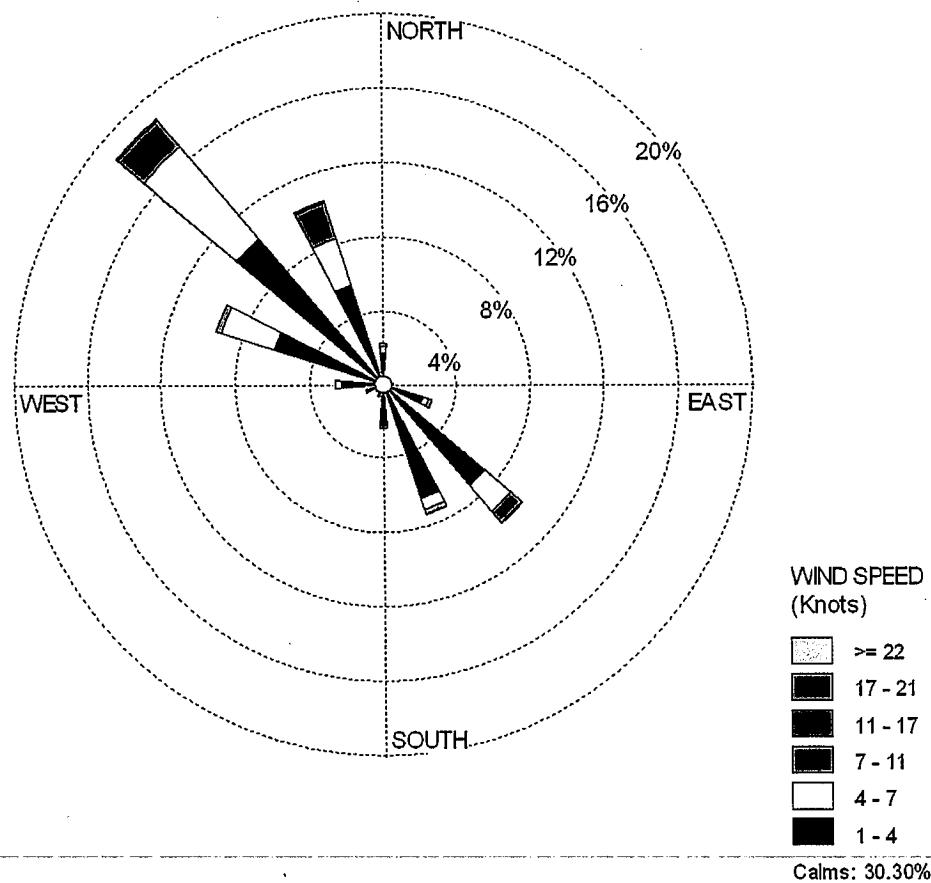
The NAD83 coordinate system was used in the analysis. The receptor grid consists of a fine receptor spacing of 100 meters to 3 km from the facility and a coarse receptor spacing of 250 meters beyond 3 km, as needed to cover the area of interest (5 km from the facility for 1-hour NO_x, CO, and PM₁₀; 10 km from the facility for annual NO_x). For the increment analysis for annual NO_x, 24-hour PM₁₀ and annual PM₁₀, modeling was completed only for receptors that are within the SIA radius.

4.2.7 Meteorology Data

To run the ISCST3 model, hourly sequential meteorological data are required. Modeling used surface air monitoring data for Blue Lake Rancheria, from 2000 through 2004, processed with Oakland Airport upper air data. The wind rose is shown in Figure 4.

Use of Blue Lake Rancheria data is requested under the Stipulated Order. The closest sites for upper air data are Medford, Oregon and Oakland, California. Oakland data is preferred since it more closely matches the project site's coastal environment.

Figure 4. Blue Lake, California 5-Year Wind Rose from 2000 - 2004



4.2.8 Background Concentration Data

Background criteria pollutant concentration data is used to complete the modeling analyses. Blue Lake Rancheria is the nearest monitoring station, and provides the PM₁₀ background data. Background data is limited for CO and NO₂. The only monitors within the North Coast AQMD are at Ukiah and Willits. Ukiah data is used since it is the nearest regional monitor and is likely impacted by similar sources. Background monitoring data are shown in Table 4-2.

Table 4-2. Ambient Background Concentrations

| Pollutant | Averaging Period | Units | 2002 | 2003 | 2004 | Monitoring Station |
|------------------|----------------------|--------------------------|---------------|---------------|---------------|---------------------|
| CO | 1 Hour – California | ppm µg/m ³ | 3.1 3561 | 4.8 5513 | 2.3 2642 | Ukiah |
| CO | 1 Hour – Federal | ppm µg/m ³ | 3.0 3446 | 4.8 5513 | 2.0 2297 | Ukiah |
| CO | 8 Hour – California | ppm µg/m ³ | 2.55 2929 | 2.18 2504 | 1.78 2044 | Ukiah |
| CO | 8 Hour – Federal | ppm µg/m ³ | 1.87 2148 | 2.05 2355 | 1.65 1895 | Ukiah |
| NO ₂ | 1 Hour – California | ppm µg/m ³ | 0.038 71.7 | 0.042 79.2 | 0.039 73.6 | Ukiah |
| NO ₂ | Annual – Federal | ppm µg/m ³ | 0.010 18.9 | 0.009 17.0 | 0.009 17.0 | Ukiah |
| PM ₁₀ | 24 Hour – California | µg/m ³ | 49.7 | 57.6 | 47.2 | Blue Lake Rancheria |
| PM ₁₀ | 24 Hour – Federal | µg/m ³ | 46.5 | 41.5 | 43.3 | Blue Lake Rancheria |
| PM ₁₀ | Annual – California | µg/m ³ | 17.7 | 13.5 | 15.2 | Blue Lake Rancheria |
| PM ₁₀ | Annual – Federal | µg/m ³ | 13.9 | 11.2 | 12.4 | Blue Lake Rancheria |

NO₂ and 8-Hour CO data from www.arb.ca.gov/adam/welcome.html. 1-Hour CO data from www.epa.gov/air/data/reports.html. Highest values used for California short-term background. Highest second highest values used for federal short-term background. Highest values used for annual background, except average value used for federal PM₁₀ annual background. Reported concentrations in ppm converted to µg/m³ based on standard conditions (25°C).

4.2.9 NO_X to NO₂ Concentration Adjustments

NO_X emitted from combustion sources consists of both nitrogen monoxide (NO) and NO₂. The PSD modeling study requires NO₂ concentrations for comparison with ambient standards and increment limits. The following procedures were used to quantify the fraction of NO_X that is present as NO₂.

Hourly NO₂

The physical and chemical conversion of NO to NO₂ in the atmosphere is limited by the amount of time for reactions and the amount of ozone available to complete the reactions. The Ozone Limiting Method (OLM) (Cole & Summerhays, 1979) was used to quantify the short-term conversion of NO_x to NO₂.

NO_x emissions consist of a mixture of NO₂ and NO. Once emitted, NO is converted to NO₂ by reaction with ozone (O₃). Therefore, the amount of NO that can be converted to NO₂ is limited by the ambient ozone level. Using OLM, 10 percent of NO_x emitted from the equipment is assumed to be NO₂ initially, and 90 percent is assumed to be NO. The remaining NO concentration is compared to the ambient ozone concentrations. If the NO concentration is less than the ozone concentration, all NO is assumed to convert to NO₂. If the NO concentration is greater than the ozone concentration, then only the portion of NO equal to the ozone concentration is converted to NO₂. For comparison to the hourly standard, the resulting NO₂ concentrations are added to the NO₂ background value.

The background ozone and NO₂ values used in the OLM calculations are based on the hour during the last three years with the highest ozone plus NO₂. The nearest ozone and NO₂ monitor is in Ukiah. Ukiah's maximum ozone plus NO₂ value occurred August 18, 2005 at 9 pm (0.088 ppm ozone and 0.007 ppm NO₂).

NO₂ emissions will be 10% of the modeled NO_x concentration, plus 166.0 µg/m³ (based on 0.088 ppm ozone converting 0.088 ppm NO to NO₂), plus 13.2 µg/m³ (based on 0.007 ppm background NO₂ during the highest O₃ + NO₂ hour).

Annual NO₂

For long-term NO₂ concentrations, the maximum annual average NO_x concentrations from modeling are converted to NO₂ concentrations using a default factor, 0.75, specified in the *Guideline on Air Quality Models* (40 CFR Part 51, Appendix W). For comparison to the annual standard, resulting NO₂ concentrations are added to the NO₂ background value.

5.0 MODEL RESULTS

Model results are described within this section. Figures showing the modeling results are provided as Appendix C.2, *Modeling Figures*.

5.1 Determining Significant Impact Area

The Generating Station CO, NO₂ and PM₁₀ emissions were modeled for comparison with Significant Impact Levels (SILs). The SILs for 1-Hour and 8-Hour CO concentrations, 1-Hour and annual NO₂ concentrations and 24-Hour and Annual PM₁₀ are shown in Table 5-1. In addition, Table 5-1 shows model results for the maximum impacts and the maximum distance from the source to a receptor exceeding the SILs. The Significant Impact Area (SIA) is a

Table 5-1. Generating Station Significant Impact Area Air Dispersion Model Results

| Pollutant | Averaging Period | Facility Peak Modeled Concentration ($\mu\text{g}/\text{m}^3$) | Significant Impact Level ($\mu\text{g}/\text{m}^3$) | SIL Exceeded? | Maximum Distance to Receptor Exceeding SIL (km) |
|------------------|------------------|--|---|---------------|---|
| CO | 1-Hour | 842.4 at 416600 E 4526800 N | 2,000 | No | None |
| CO | 8-Hour | 386.9 at 416500 E 4526900 N | 500 | No | None |
| NO ₂ | 1-Hour | 2,798 (459.0) ¹ at 416201.3 E 4525558.5 N | 19 | Yes | 0.97 |
| NO ₂ | Annual | 4.528 (3.396) ² at 418400 E 4524000 N | 1.0 | Yes | 8.52 |
| PM ₁₀ | 24-Hour | 8.064 at 417800 E 4525300 N | 5.0 | Yes | 3.12 |
| PM ₁₀ | Annual | 1.148 at 418400 E 4524000 N | 1.0 | Yes | 3.03 |

¹ Hourly NO₂ results limited to 10% of modeled concentration plus 166.0 $\mu\text{g}/\text{m}^3$ (ozone limited NO₂) plus 13.2 $\mu\text{g}/\text{m}^3$ (background NO₂ during highest ozone & NO₂ hour).

² Annual NO₂ results reduced by Ozone Limiting default factor of 0.75

circular area, centered at the source, whose radius includes all receptors which may exceed the SILs.

If a SIL is exceeded, then additional modeling is required for all receptors within the SIA. The largest impact area for a given pollutant is used in all analyses for that pollutant. There is no SIA for CO. A SIA with 8.52 km radius is used for increment and ambient air quality standards modeling analyses for NO₂. A SIA with 3.12 km radius is used for increment and ambient air quality standards modeling analyses for PM₁₀.

5.2 Comparison with PSD Monitoring Exemption Thresholds

Under PSD, the permitting authority may exempt a facility from a requirement to collect one year of continuous ambient air quality monitoring data if either modeled impacts or existing air quality levels are below the thresholds shown in Table 5-2.

Table 5-2. PSD Monitoring Exemption Thresholds

| Pollutant | Averaging Period | Facility Peak Modeled Concentration ($\mu\text{g}/\text{m}^3$) | PSD Monitoring Exemption Threshold ($\mu\text{g}/\text{m}^3$) | Threshold Exceeded? |
|------------------|------------------|--|---|---------------------|
| CO | 8-Hour | 386.9 at 416500 E 4526900 N | 575 | No |
| NO ₂ | Annual | 4.528 (3.396) ¹ at 418400 E 4524000 N | 14 | No |
| PM ₁₀ | 24-Hour | 8.064 at 417800 E 4525300 N | 10 | No |

¹ Annual NO₂ results reduced by Ozone Limiting default factor of 0.75

Background concentrations at Ukiah and Blue Lake Rancheria monitoring stations exceed the above PSD monitoring exemption thresholds. The 8-Hour value for CO, the annual value for NO₂, and the 24-Hour value for PM₁₀ are all less than the PSD monitoring exemption thresholds.

Based on modeling results, PSD monitoring should not be required. PM₁₀ is already monitored at nearby Blue Lake Rancheria. In addition, the existing CO and NO₂ air quality for this relatively remote location can be conservatively represented by the existing monitors at Ukiah.

5.3 Compliance with Ambient Air Quality Standards

Background levels were added to modeled concentrations from the Generating facility emissions for comparison to California and National Ambient Air Quality Standards (AAQS). Modeling results are shown in Table 5-3. All results comply with both California and National Ambient Air Quality Standards.

Table 5-3. Compliance with California and National Ambient Air Quality Standards

| Pollutant | Averaging Period | Facility Modeled Conc. ($\mu\text{g}/\text{m}^3$) | Background ($\mu\text{g}/\text{m}^3$) | Total ($\mu\text{g}/\text{m}^3$) | AAQS ($\mu\text{g}/\text{m}^3$) | Standard Exceeded ? |
|----------------------------------|------------------|---|---|------------------------------------|-----------------------------------|---------------------|
| <i>State Standards</i> | | | | | | |
| CO | 1-Hour | 842.4 at 416600 E 4526800 N | 5,513 | 6,355 | 23,000 | No |
| CO | 8-Hour | 386.9 at 416500 E 4526900 N | 2,929 | 3,316 | 10,000 | No |
| NO ₂ | 1-Hour | 2,798 (445.8) ¹ at 552840E 4151360N | 79.2 (13.2) ¹ | 2,877 (459.0) ¹ | 470 | No |
| PM ₁₀ | 24-Hour | 8.064 at 417800 E 4525300 N | 57.6 | 65.7 | 50 | Yes |
| PM ₁₀ | Annual | 1.148 at 418400 E 4524000 N | 17.7 | 18.8 | 20 | No |
| <i>National Standards</i> | | | | | | |
| CO | 1-Hour | 842.1 ² at 416600 E 4526800 N | 5,513 ² | 6,355 | 40,000 | No |
| CO | 8-Hour | 386.8 ² at 416500 E 4526900 N | 2,355 ² | 2,742 | 10,000 | No |
| NO ₂ | Annual | 4.528 (3.396) ³ at 418400 E 4524000 N | 18.9 | 23.4 (22.3) ³ | 100 | No |
| PM ₁₀ | 24-Hour | 5.313 ⁴ at 416200 E 4527100 N | 46.5 ² | 51.8 | 150 | No |
| PM ₁₀ | Annual | 1.043 ⁵ at 417800 E 4523700 N | 12.5 ⁵ | 13.5 | 50 | No |

¹ Hourly NO₂ results limited to 10% of modeled concentration plus 166.0 $\mu\text{g}/\text{m}^3$ (ozone limited NO₂) plus 13.2 $\mu\text{g}/\text{m}^3$ (background NO₂ during highest ozone & NO₂ hour).

² Highest 2nd high values.

³ Annual NO₂ results reduced by Ozone Limiting default factor of 0.75.

⁴ Sixth highest in 5 years

⁵ Period average

5.4 PSD Increment Consumption

A PSD increment consumption analysis was completed by including emissions from nearby facilities. Annual NO₂, 24-Hour and Annual PM₁₀ was addressed in the PSD increment consumption analysis. Emissions parameters were provided by AQMD for nearby sources. This data is included in Appendix C.3 *AQMD Nearby Source Data*. Stack data was obtained from EPA's EnviroFacts database and supplemented with default values where missing.

The annual NO₂ model result was 31.45 $\mu\text{g}/\text{m}^3$ at 410250E 4527500N, reduced to 23.59 $\mu\text{g}/\text{m}^3$ by the default 75% ozone limiting adjustment. This result does not exceed the PSD increment of 25 $\mu\text{g}/\text{m}^3$. The annual NO₂ contribution from the facility was only 0.337 $\mu\text{g}/\text{m}^3$ (1.07 %), reduced to 0.253 $\mu\text{g}/\text{m}^3$ by the default 75% ozone limiting adjustment. The 24-Hour PM₁₀ model result was 10.41 $\mu\text{g}/\text{m}^3$ at 417800E 4525300N. This result does not exceed the PSD increment of 30 $\mu\text{g}/\text{m}^3$. The 24-Hour PM₁₀ contribution from the facility was 2.316 $\mu\text{g}/\text{m}^3$ (22.2 %). The Annual PM₁₀ model result was 2.389 $\mu\text{g}/\text{m}^3$ at 416500E 4525300N. This result does not exceed the PSD increment of 17 $\mu\text{g}/\text{m}^3$. The annual PM₁₀ contribution from the facility was 0.252 $\mu\text{g}/\text{m}^3$ (10.5 %). PSD increment modeling results are provided in Table 5-4.

Table 5-4. PSD Increment Air Dispersion Model Results

| Pollutant | Averaging Period | Distance from Facility Sources (km) | Facility & Nearby Sources Modeled Concentration ($\mu\text{g}/\text{m}^3$) | Facility Contribution ($\mu\text{g}/\text{m}^3$) | PSD Increment ($\mu\text{g}/\text{m}^3$) | Increment Exceeded? |
|------------------|------------------|-------------------------------------|--|--|--|---------------------|
| NO ₂ | Annual | 6.2 | 31.449 (23.588) ¹ at 410250 E 4527500 N | 0.337 (0.253) ¹ (1.07 %) | 25 | No |
| PM ₁₀ | 24-Hour | 1.7 | 10.412 at 417800 E 4525300 N | 2.316 (22.2 %) | 30 | No |
| PM ₁₀ | Annual | 0.46 | 2.389 at 416500 E 4525300 N | 0.252 (10.5%) | 17 | No |

¹ Annual NO₂ results reduced by Ozone Limiting default factor of 0.75

6.0 CLASS I AREA ANALYSIS AND RESULTS

6.1 Introduction

As part of a PSD application, the facility must analyze other air quality related values (AQRVs) at Class I areas. An AQRV, as defined by USEPA, "...is a scenic, cultural physical, biological ecological or recreational resource which may be affected by a change in air quality..." (Federal Register, Vol. 61, No. 42, July 23, 1996). NSR and PSD regulations in 40 CFR Parts 51 and 52 were finalized and presented in the Federal Register, Vol 67, No. 261 on December 31, 2002. The Federal Land Managers' Air Quality Related Workgroup (FLAG) Phase 1 Report (December 2000) discussed implementation of PSD requirements at Federal Class I areas. These include potential impacts to visibility, soils and vegetation at Class I areas. The FLAG for a particular Class I area is associated with the National Parks Service (NPS), United States Fish and Wildlife Service (USFWS) or the United States Department of Agriculture Forest Service (USDAFS). This section describes these analyses and compares the AQRV impacts from operation of the Ultrapower 3 facility with significance criteria.

The nearest Class I area to the project site is the Redwood National Park (NPS), approximately 22 km to the north (UTM 416 km East, 4548 km North). The next nearest Class I areas, the Marble Mountain Wilderness and the Yolla Bolly Middle Eel Wilderness, are substantially more distant at 101 km to the northeast and 150 km to the southeast, respectively and are not considered further. The location of these three Class I areas with respect to the project site is shown in Figure 5.

The NPS has identified AQRVs and Limits of Acceptable Change (LAC) for sensitive receptors within each of the Class I areas. Pollutants of concern include SO_x, NO_x, O₃ and particulate matter (PM). NPS guidelines were followed to estimate the impacts of the proposed project on the Redwood National Park.

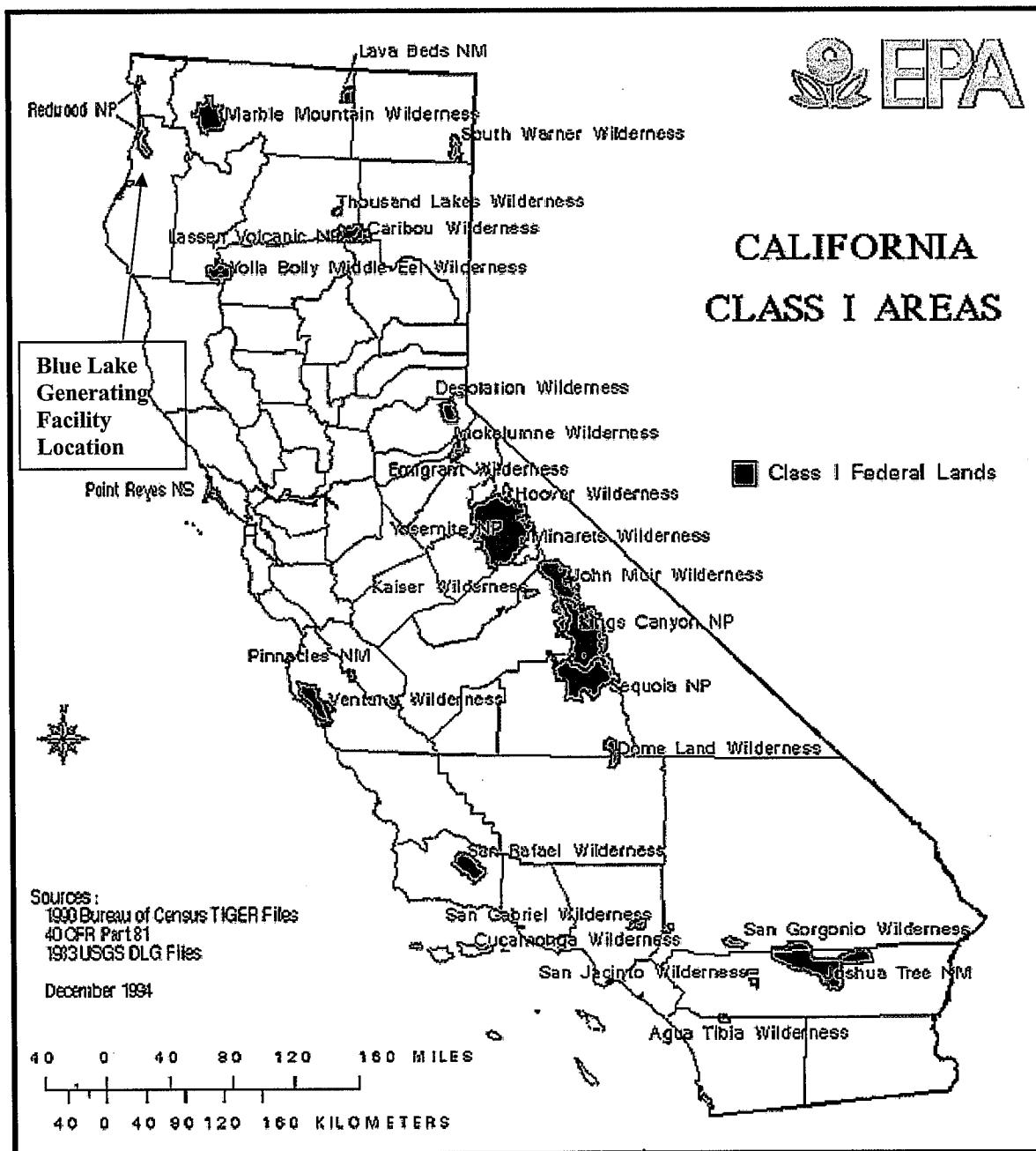
A Level-1 visibility screening analysis was conducted for the Redwood National Park. The SIA modeling analysis showed impacts below the SILs at less than half the distance to the nearest boundary of the Redwood National Park Class I area. An additional ISCST3 model run was made to verify the very low project impacts at the nearest Class I area.

6.1.1 Visibility Analysis

The USEPA computer model VISCREEN (Version 1.01) was used to assess the impacts of emissions from the proposed Ultrapower 3 project on visibility at the Redwood National Park. The methodology followed USEPA's *Workbook for Plume Visual Impact Screening and Analysis (Revised)* [EPA-454/R-92-023, October 1992].

VISCREEN calculates the change in plume contrast against a bright background, the sky and against a dark background, the terrain. VISCREEN makes these calculations for a short wavelength (blue at 45 μm), a medium wavelength (green at 55 μm) and a long wavelength (red at 65 μm). If the contrasts are different at different wavelengths, the plume is discolored. If the contrasts are the same at different wavelengths, the plume is indistinguishable from background.

Figure 5. California Class I Areas



6.1.1.1 Level-1 Visibility Screening. Level-1 visibility screening was conducted in accordance with the methodology described in the Workbook (USEPA, 1992). The distance from the proposed project to the nearest boundary of the Redwood National Park, 22 km, was conservatively selected as the distance to the nearest observer. The plume centerline is assumed along this path. The distance from the proposed project to the farthest boundary location of the Class I area, 98 km, was input to obtain the maximum distance seen by the observer that the plume would travel across the Class I area.

Emissions entered into VISCREEN were based on the proposed project's maximum emissions for PM and NO_x, as recommended in the FLAG report (2000). The background visual range for Redwood National Park was given as 230 km (John Notar, NPS). This value was used by the model for the visual range at the Class I area.

Model default values were selected for other input, as recommended in the Workbook (USEPA, 1992). The worst-case meteorological conditions of wind speed at 1.0 meters per second (mps) and atmospheric stability of "F" were selected by the model.

Results showed that potential worst-case changes in contrast would not exceed the very conservative screening value thresholds. The screening analysis showed that the perception parameter, delta E, is slightly exceeded against both the terrain (2.7 vs. 2.0) and the sky (4.1 vs. 2.0). Delta E is a quantitative assessment of perception of brightness (intensity), lightness (saturation) and color (hue). VISCREEN calculates these parameters for the three primary colors, red, green and blue. Since the Level-1 visibility screening analysis showed that the screening criteria might be exceeded, additional analysis was required.

6.1.1.2 Level-2 Visibility Screening. A limited Level-2 visibility screening analysis was conducted. Level-2 considers frequency and cumulative frequency of occurrence of dispersion conditions (atmospheric stability and wind speed) for given time of day in the wind direction from the source (Ultrapower 3) toward the Class I area (Redwood National Park). A Level-2 screening also allows adjustment to particle size.

BlueScape's approach was to evaluate the fraction of time winds historically blew from the source to the receptor. Since the very conservative Level-1 visibility analysis results exceeded the screening threshold by slightly more than a factor of 2, demonstrating that the winds blow from the source to the Class I area less than 50 percent of the time would show compliance with the screening criteria. If necessary, analysis of conditions with wind speeds resulting in transport times longer than 12 hours could be conducted to further reduce impacts on visibility. Finally, particle size data associated with wood combustion could be input to INPUFF, in lieu of default particle size data to enhance deposition, even further reducing project impacts on visibility.

Surface winds reported from the Blue Lake Rancheria meteorological station for the period January 1, 2000 through December 31, 2004 (a five year period) were predominantly from the northwest and north-northwest blowing towards the southeast and south-southeast, as shown in Figure 4. The wind blew from the south to the north, or from Ultrapower 3 to Redwood National Park, less than four percent of the time. Furthermore, most of the time winds were from the south, wind speeds were low, resulting in long, up to more than 12 hours, of transport time.

According to the visibility screening workbook, it is unlikely that steady-state plume conditions would persist for more than 12 hours (*Workbook for Plume Visible Impact Screening and Analysis (Revised)*, EPA-454/R-92-023, 1992). The Workbook recommends discarding data for meteorological conditions which would result in more than 12 hours of plume transport to a Class I area.

Table 6-1 shows the speed and frequency of occurrence of winds blowing from the south. Most of the observations where winds are from the south (from the source to the Class I area) can be discarded. The low frequency of occurrence of winds blowing from the project location to the Redwood National Park at speeds that would transport pollutants from the project to the Class I area would reduce the VISCREEN values for delta E (perception) to acceptable levels.

Table 6-1. Fraction of Occurrence of Wind Speed and Wind Direction, 2000 – 2004¹

| Wind Direction, Degrees | Wind Speed (mps) | | | | | | | | | Total |
|-------------------------------|------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------|-------|
| | 0.0 - 1.0 | 1.0 - 2.0 | 2.0 - 3.0 | 3.0 - 4.0 | 4.0 - 5.0 | 5.0 - 6.0 | 6.0 - 7.0 | 7.0 - 8.0 | >= 8.0 | |
| 348.75 - 11.25 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 11.25 - 33.75 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 33.75 - 56.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 56.25 - 78.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 78.75 - 101.25 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 101.25 - 123.75 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 123.75 - 146.25 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 146.25 - 168.75 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 168.75 - 191.25 | 0.56 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.58 |
| 191.25 - 213.75 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 213.75 - 236.25 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 236.25 - 258.75 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 258.75 - 281.25 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 281.25 - 303.75 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| 303.75 - 326.25 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 326.25 - 348.75 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 |
| Sub-Total: | 0.56 | 0.44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |

¹Total observations = 43,848

6.1.2 Soil and Vegetation Analysis

An analysis of the potential impacts of air pollutants from the proposed project on soil and vegetation at the Redwood National Park was conducted. USEPA (1990) stated that for most types of soils and vegetation, ambient concentrations of criteria pollutants below the secondary NAAQS would not result in harmful effects. Therefore, modeling was conducted to determine the maximum annual concentration of NO_x, the pollutant of concern from the Ultrapower 3 project, at the nearest boundary of the Redwood National Park area.

The ISCST3 model was used to estimate impacts at the nearest boundary of the Redwood National Park Class I area, 22 kilometers north of the Ultramar 3 facility. Modeling results showed the maximum NO_x concentration is 0.0024 µg/m³ at the nearest Redwood National Park boundary. Impacts at other locations within the Redwood National Park would be lower. Likewise, the maximum SO₂ concentration predicted at the nearest boundary of the Redwood National Park is 0.00035 µg/m³ and the maximum PM₁₀ concentration is 0.0006 µg/m³.

6.1.2.1 Soils

Pollutants that can result in the formation of strong acids can have a detrimental affect on soils and water. These include NO_x and SO₂. The lower the alkalinity, or acid neutralizing capacity (ANC), of the soil, the greater the potential damage to streams, rivers, ponds and lakes from these pollutants. The higher the ANC the greater the resistance of the water body to acidification.

The surface waters in Redwood National Park are moderately buffered. It is not known if the soil and vegetation in the park are sensitive to acid deposition. Monitoring of wet and dry deposition rates for nitrogen and sulfur was conducted at Gasquet, 10 km northeast of the park, from 1990 through 1998, during the time Ultrapower 3 was operating. Deposition rates for nitrogen and non-marine sulfur were low. (*Redwood National Park Air Quality Information*, www2.nature.nps.gov/air/Permits/ARIS/redw/, February 2006).

Annual NO_x concentrations at the Redwood National Park due to emissions from the proposed project are less than 0.0024 µg/m³. Emissions of SO₂ from the proposed Ultrapower 3 facility are about five times, lower. The predicted concentrations of these pollutants from the proposed project are trivial, below the significance threshold and would not be expected adversely impact soils at this Class I location.

6.1.2.2 Vegetation

Sensitive vegetation identified in the Redwood National Park by the NPS are the Jeffrey pine (*Pinus jeffreyi*) and Douglas' sagewort (*Artemisia douglasiana*). These plants are sensitive to ozone. Ozone was monitored with a continuous analyzer from 1987 through 1995. Ultrapower 3 operated for some of the time while monitoring was ongoing. Monitored ozone concentrations were reported to be low. It was stated that monitored ozone concentrations were unlikely to cause any damage to vegetation (*Redwood National Park Air Quality Information*, 2006).

Annual NO_x and SO₂ concentrations at the Redwood National Park from the proposed project are both less than 0.0024 and 0.00035 µg/m³. NO_x is an ozone precursor. High concentrations of SO₂ may also be damaging to vegetation. The predicted concentrations of these pollutants are trivial and would not be expected adversely impact vegetation at this Class I location.

6.1.3 Growth Analysis

The growth analysis reviews the potential impacts on air quality from project induced growth. Of specific concern are potential secondary emissions which might occur from additional workers and increased nearby residences or businesses as a result of project operations.

The Ultrapower 3 facility is an existing facility. No new industry is anticipated in the area due to its continued operation. Additional electricity will be supplied to nearby communities. If the Ultrapower 3 facility was not constructed, alternative sources would supply electric power to those communities. Therefore the Blue Lake community would not experience any potential air quality impacts from project-related growth.

6.2 Class I Summary

The nearest Class I areas to the project site are the Redwood National Park, Marble Mountain Wilderness Area and the Yolla Bolly Middle Eel Wilderness Area. The nearest boundary of the Class I areas are located about 22 km, 101 km, and 150 km from the project location, respectively. The location of these Class I areas with respect to the project site is shown in Figure 5. The project impacts are within the LACs.

7.0 HEALTH RISK ASSESSMENT

This section describes the HRA methodology and results. Methodology follows OEHHA's *Air Toxics Program Risk Assessment Guidelines* (August 2003).

7.1 Pollutants Modeled

Air toxics emissions have been calculated for the wood and propane combustion in the boiler, and diesel combustion in the emergency water pump and emergency generator. Air toxics emissions from the cooling tower are assumed negligible. Air toxic emissions are provided in Appendix B, *Emissions Calculations*.

Wood Combustion

Maximum hourly and annual emissions for wood combustion are calculated from the boiler rating of 185 MMBtu/hr and 8,760 hours per year. Organic air toxic emissions are quantified using CARB's California Air Toxic Emission Factor (CATEF) database mean values for wood fired boilers (Source Classification Code 10100903). CATEF does not include inorganic emission factors specific to this process and control device, so inorganic emission factors are quantified using AP-42 Section 1.6 emission factors.

Propane Combustion

Maximum hourly emissions for propane combustion are based on the burner rating of 80 MMBtu/hr. Annual emissions for propane combustion are based on the permit limit of 1.78 million gallons per year. Emission factors are based on Ventura County air toxic emission

factors (natural gas, external combustion, 10 to 100 MMBtu/hr), converted based on 1,000 Btu per scf natural gas and 90,000 Btu per gallon propane.

Diesel Internal Combustion

Maximum hourly emissions for diesel combustion are based on the engine rating. Annual emissions are based on 20 hours per year for maintenance and testing (as limited by the California Air Toxics Control Measure for diesel particulate matter from stationary engines). Air toxic emissions are collectively quantified as diesel particulate matter, using AP-42 Section 3.3 emission factors.

7.2 Dispersion Analysis

Both air dispersion modeling and exposure assessment was performed using CARB's HotSpots Analysis and Reporting Program (HARP), version 1.2a (August 2005). HARP incorporates the ISCST3 air dispersion model (version 99155). Air dispersion modeling was performed using the same control parameters, procedures, and 2000 to 2004 Blue Lake Rancheria meteorological data as discussed above for the AQIA and PSD modeling.

The receptor grid consisted of 100 meters spacing out to 4 km, sufficient to include the zone of impact for cancer risk greater than 1 in one million, and sufficient to include maximum non-cancer risks (all below the significance threshold of a hazard index greater than 1.0). The receptor grid also included boundary receptors at 20 meter spacing along the facility fenceline, receptors at census blocks (to determine cancer burden), and a receptor at Blue Lake Elementary School (at 416290E, 4526430N, the only sensitive receptor identified within the 4 km receptor grid).

7.3 Exposure Assessment

Exposure assessment was calculated by HARP from the ISCST3 output. HARP offers several alternatives for exposure calculations. In accordance with CARB interim guidelines (October 9, 2003), for cancer risk, the risk assessment presents Derived (OEHHA) Calculations and Derived (Adjusted) Calculations. The Derived (OEHHA) Calculations use a peak breathing rate, while the Derived (Adjusted) Calculations use an 80th percentile breathing rate. For chronic non-cancer exposure, the risk assessment presents Derived (OEHHA) Calculations. Acute non-cancer exposure is calculated using the HARP default method.

Risks for residential receptors consider exposure through inhalation, soil ingestion, dermal, homegrown vegetables (assuming 15% rural default), and mother's milk pathways. Risks for worker receptors consider exposure through inhalation, soil, and dermal pathways. Drinking water, fish, and livestock pathways were not included (due to dilute concentration in Mad River and limited fraction of diet expected from potentially contaminated sources).

7.4 Health Risk Factors

Health risks were quantified by HARP using current risk factors available on the CARB web site (www.arb.ca.gov/toxics/harp/harpdownload.htm). The most recent available data is HARP version 1.2a (August 26, 2005).

7.5 HRA Results

HRA results are summarized in Tables 7-1 through 7-3. HRA modeling files are provided in Appendix E.1, *HARP Modeling Files*. Isopleths for the HRA results are provided in Appendix E.2, *HARP Modeling Figures*.

Cancer Risk

The Maximum Individual Cancer Risk (MICR) predicted at an offsite location was 33.5 in one million (Derived OEHHA method) or 25.8 in one million (Derived Adjusted method) predicted on the facility boundary, immediately southeast of the engine stacks. Since receptors at this location are workers, the risk levels are adjusted to 5.08 in one million by use of HARP's default worker assumptions (Point Estimate method).

The MICR predicted at a residential location was 1.94 in one million (Derived OEHHA method) or 1.50 in one million (Derived Adjusted method) predicted approximately 540 meters northnortheast (NNE) of the engine stacks.

The MICR predicted at a sensitive receptor (Blue Lake Elementary School) was 0.184 in one million (Derived OEHHA method) or 0.142 in one million (Derived Adjusted method).

More than 90 percent of the cancer risk is attributed to diesel particulate matter from the diesel emergency generator and diesel emergency boiler water pump. To limit cancer risk, the diesel engines will comply with clean fuel requirements and operating limits of the California Air Toxic Control Measure for Stationary Diesel Engines.

Cancer burden is calculated for receptors exceeding the de minimis MICR threshold of 1 in one million. Based on census block information in HARP, 81 individuals in five census blocks (receptors 6632, 6668, 6672, 6737 and 6738) are exposed to cancer risk of 1 in one million, with a predicted cancer burden of 0.000090.

No receptors exceeded the cancer significance threshold of 10 in one million (after adjustment of maximum impacts for limited worker exposure).

Table 7-1. Cancer Risk

| Location | Method | MICR | Location | Receptor Number |
|---|------------------|----------------------|---------------------|------------------------|
| Max Offsite (not adjusted for worker) | Derived OEHHA | 33.5 in one million | 416244E 4525605N | 6578 |
| | Derived Adjusted | 25.8 in one million | | |
| Max Worker | Point Estimate | 5.08 in one million | | |
| Max Residence | Derived OEHHA | 1.94 in one million | 415900E 4526100N | 2873 |
| | Derived Adjusted | 1.50 in one million | | |
| Blue Lake Elementary | Derived OEHHA | 0.184 in one million | 416290E 4526430N | 6631 |
| | Derived Adjusted | 0.142 in one million | | |

Chronic Noncancer Risk

The maximum chronic noncancer health risk predicted at an offsite location was a Hazard Index (HI) of 0.147 (Derived OEHHA method) predicted approximately 2,500 meters southeast (SE) of the electrostatic precipitator stack.

At Blue Lake Elementary School the predicted chronic HI was less than 0.001.

More than 90 percent of the chronic noncancer risk is attributed to chlorine and hydrochloric acid emissions. At significant concentrations, these compounds may impact the human respiratory system.

No receptors exceeded the chronic HI significance threshold of 1.0.

Table 7-2. Chronic Noncancer Health Risk

| Health Risk | Method | Hazard Index | Location | Receptor Number |
|-------------------------|---------------|---------------------|---------------------|------------------------|
| Max Offsite | Derived OEHHA | 0.147 | 417800E 4523700N | 4836 |
| Blue Lake Elementary | Derived OEHHA | 0.000996 | 416290E 4526430N | 6631 |

Acute Noncancer Risk

The maximum acute noncancer health risk predicted at an offsite location was a Hazard Index (HI) of 0.148 (Simple Concurrent Maximum method) predicted approximately 1,250 meters northnortheast (NNE) of the electrostatic precipitator stack.

At Blue Lake Elementary School the predicted acute HI was 0.0190.

More than 90 percent of the acute noncancer risk is attributed to acrolein emissions. At significant concentrations, these compounds may impact the human eye and respiratory systems.

No receptors exceeded the acute HI significance threshold of 1.0.

Table 7-3. Acute Noncancer Health Risk

| Location | Method | Hazard Index | Location | Receptor Number |
|----------------------|-------------------------|---------------------|---------------------|------------------------|
| Max Offsite | Simple (Concurrent Max) | 0.148 | 416600E 4526800N | 2313 |
| Blue Lake Elementary | Simple (Concurrent Max) | 0.0190 | 416290E 4526430N | 6631 |

8.0 CONCLUSION

Ultrapower 3, SCS and BlueScape Environmental have provided an AQIA/PSD Modeling Report for CO, NO_x and PM₁₀ emissions and an HRA Modeling Report for air toxic emissions. BlueScape would like to submit this formal PSD Air Dispersion Modeling Report to AQMD staff. After approval of this modeling report, the Title V permit application and the Title V permit renewal, it is our understanding that operation of the Blue Lake Ultrapower 3 Generating Station may commence again.

APPENDIX A
Modeling Protocol Dated December 20, 2005

PSD & HRA AIR QUALITY MODELING PROTOCOL

BLUE LAKE ULTRAPOWER 3

GENERATING STATION

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December 20, 2005
File No. 05-0239:01

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LIST OF ACRONYMS

| | |
|------------------|---|
| AAQS | Ambient Air Quality Standards |
| AP-42 | USEPA, <u>Compilation of Air Pollutant Emission Factors</u> , AP-42, Fifth Edition, January 1995, Supplements A through E, September 2005 |
| AQIA | Air Quality Impact Analysis |
| AQRV | Air Quality Related Values |
| BlueScape | BlueScape Environmental |
| BPIP | Building Profile Input Program |
| Btu | British Thermal Unit |
| CAAQS | California Ambient Air Quality Standards |
| CARB | California Air Resources Board |
| CO | Carbon Monoxide |
| DEM | USGS Digital Elevation Model |
| ESP | Electrostatic Precipitator |
| GEP | Good Engineering Practice |
| gpm | Gallons per minute |
| HARP | Hotspots Analysis and Reporting Program |
| hp | Horsepower |
| HRA | Health Risk Assessment |
| IC | Internal Combustion |
| ISCST3 | Industrial Source Complex Short Term Version 3 – USEPA Modeling Software |
| km | Kilometers |
| kW | Kilowatt |
| MMBtu | Million British Thermal Unit |
| MW | Megawatt |
| NAAQS | National Ambient Air Quality Standards |
| NAD83 | North American Datum 1983 |
| NCAQMD | North Coast Unified Air Quality Management District |
| NPS | National Park Service |
| NO _x | Oxides of Nitrogen |
| NO ₂ | Nitrogen Dioxide |
| O ₃ | Ozone |
| OAR | Oregon Administrative Rules |
| OEHHA | California Office of Environmental Health Hazard Assessment |
| OLM | Ozone Limiting Method |
| PM | Particulate Matter |
| PM ₁₀ | Particulate Matter with aerodynamic diameter less than 10 microns |
| PSD | Prevention of Significant Deterioration |
| ROI | Range of Influence |
| SCS | SCS Engineers |
| SER | Significant Emission Rates |
| SIA | Significant Impact Area |

| | |
|-------|---|
| SIL | Significant Impact Level |
| tpy | tons per year |
| USEPA | United States Environmental Protection Agency |
| USGS | United States Geological Survey |
| VOC | Volatile Organic Compounds |
| UTM | Universal Transverse Mercator |

1.0

INTRODUCTION

The Blue Lake Generating Station, located in the town of Blue Lake in Humboldt County, California, is owned and operated by Ultrapower 3, a subsidiary of North American Power Group. Until April 1999, this 13.1 megawatt (MW) biomass electrical generation facility used wood chips (biomass) to provide heat to a Zurn Corporation Boiler. In April 2005, the North Coast Unified Air Quality Management District (AQMD) filed a petition for revocation of AQMD Permit No. NS-071 and Title V Permit No. NCFU 097-12. For the past six years (1999 – 2005), the facility has not been in operation. In order to resume function at this facility, a Stipulated Order requires that Ultrapower 3 must submit a new permit application for the AQMD Permit to Operate and the United States Environmental Protection Agency (USEPA) Title V Permit.

To satisfy the Stipulated Order, Ultrapower 3 must conduct Air Quality Impact Analysis (AQIA) modeling, Prevention of Significant Deterioration (PSD) modeling and a Health Risk Assessment (HRA) for the Blue Lake Generating Station. On behalf of Ultrapower 3, SCS Engineers (SCS) and BlueScape Environmental (BlueScape) will conduct these three analyses and report results to the AQMD. The AQIA and PSD modeling will be based on the facility's potential-to-emit (PTE) of the following regulated air pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter less than 10 µm in diameter (PM₁₀) and sulfur oxides (SO_x). The HRA will be based on the facility's PTE for pollutants assigned health risk factors by the California Office of Environmental Health Hazard Assessment (OEHHA). This Modeling Protocol describes the methodology that will be followed to complete the modeling and HRA studies for the resumed operation of the Blue Lake Generating Station.

1.1

Site Description

The Blue Lake Ultrapower 3 Generating Station is located at 200 Taylor Way, Blue Lake, California in Humboldt County. The area immediately surrounding the Facility is an industrial park, within a small rural town. Beyond Blue Lake are low density rural and unpopulated areas. The nearest population center is Arcata, located about six kilometers (km) to the west of the Facility. Eureka is located approximately 13 km to the southwest. The Pacific Ocean is located, at nearest, about ten and a half km due west of the Generating Station. The Site location is shown in Figure 1 on page 2.

1.2

Project Description

This Facility utilizes wood combustion and steam production to generate electricity. Wood chips, acting as the fuel, are input to the Zurn Corporation Boiler (185 million Btu/hr maximum heat input). The Boiler converts water into steam from the heat generated through combustion at a rate of 105,000 pounds steam per hour. An ash reburn chamber burns carbon contained in ash from the Boiler dropout, which reduces particulate matter emissions. Boiler exhaust gas is used to dry the wood fuel prior to being feed into the Boiler. The facility uses an 80 million Btu/hr propane burner during startups, shutdowns and periods of combustion instability, limited by permit to 1.78 million gallons propane per year.



Figure 1. Blue Lake Ultralower 3 Generating Station

Other emission sources are a Cooling Tower with a 7,700 gallons per minute (gpm) circulating water flow rate, 250 kilowatt (kW) Diesel-Fired Emergency Generator, and a 125 horsepower (hp) Diesel-Fired Emergency Boiler Water Pump.

Pollution control for particulate matter is provided by a 21,002 square foot electrostatic precipitator (ESP) with a rating of 85 kVA. The wood-fired boiler and propane burner exhaust through this control device. Particulate matter control is assumed to be 98%.

2.0 CRITERIA POLLUTANT EMISSIONS

Criteria pollutant emissions of CO, NO_x, PM₁₀ and SO_x are summarized in Table 1, with emission calculations attached as Appendix A. Emissions of volatile organic compounds (VOC) are not included in Table 1 since AQIA and PSD modeling is not required for VOC.

Table 1. Criteria Pollutant Emissions

| Device | CO (ton/yr) | NO _x (ton/yr) | PM10 (ton/yr) | SO _x (ton/yr) |
|--------------------------------------|----------------|-----------------------------|------------------|-----------------------------|
| Boiler – Wood Combustion | 810.30 | 121.55 | 32.41 | 20.26 |
| Boiler – Propane Combustion | 2.85 | 16.91 | 0.53 | 0.02 |
| Emergency Boiler Water Pump – Diesel | 0.01 | 0.04 | < 0.01 | < 0.01 |
| Emergency Generator – Diesel | < 0.02 | 0.10 | < 0.01 | < 0.01 |
| Cooling Tower | --- | --- | 1.94 | --- |
| Total | 813.18 | 138.60 | 34.89 | 20.29 |
| PSD Threshold | 250 | 250 | 250 | 250 |
| Exceed PSD Threshold | YES | NO | NO | NO |
| Significant Emission Rate | 100 | 40 | 15 | 40 |
| Modeling Required | YES | YES | YES | NO |

Emissions of CO exceed the PSD threshold. Emissions of CO, NO_x and PM₁₀ exceed the significant emission rate under 40 CFR 52.21, triggering modeling requirements. No modeling is proposed for SO_x.

The modeling analysis will include emissions from the stacks listed in Table 2. Each stack will be modeled as a point source.

Table 2. Stack Parameters

| Parameter | ESP Stack | Diesel Generator | Diesel Water Pump | Cooling Tower |
|---|----------------------------|----------------------------|----------------------------|----------------------------|
| Number of Stacks | 1 | 1 | 1 | 3 |
| Stack Coordinates NAD83 (UTM km) | 416.1633 E, 4525.6225 N | 416.1934 E, 4525.6475 N | 416.1965 E, 4525.6475 N | 416.1575 E, 4525.6083 N |
| Grade Elevation at Stack (m) | 24 | 24 | 24 | 24 |
| Stack Height Above Grade (m) | 30.48 | 4.17 | 3.73 | 7.77 |
| Stack Diameter (m) | 1.52 | 0.18 | 0.08 | 4.88 each |
| Stack Gas Exit Velocity (m/s) | 15.65 | 25 ^a | 25 ^a | 10 ^a |
| Stack Gas Temperature (K) | 388.7 | 644.3 ^a | 644.3 ^a | 293 ^a |

a – Typical values.

3.0 REGULATORY REQUIREMENTS

Modeling will be performed for the pollutants and averaging intervals shown in Table 3 based on the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

Table 3. California and Federal Ambient Air Quality Standards

| Pollutant | Averaging Time | California Standards | Federal Standards |
|------------------|----------------|-----------------------------------|------------------------------------|
| CO | 1-hour | 20 ppm (23 mg/m ³) | 35 ppm (40 mg/m ³) |
| | 8-hour | 9 ppm (10 mg/m ³) | 9 ppm (10 mg/m ³) |
| NO ₂ | 1-hour | 0.25 ppm (470 µg/m ³) | ----- |
| | Annual | ----- | 0.053 ppm (100 µg/m ³) |
| PM ₁₀ | 24-hour | 50 µg/m ³ | 150 µg/m ³ |
| | Annual | 20 µg/m ³ | 50 µg/m ³ |

Compliance with California standards is based on the highest predicted result for each pollutant and averaging interval.

Based on USEPA's *Guideline on Air Quality Models* (40 CFR 51), for Federal standards and increments, 1-hr CO and 8-hr CO compliance are based on the highest second-high value in any of five years; annual NO₂ compliance is based on the highest annual average in five years; 24-hour PM₁₀ compliance is based on the highest sixth-high value over five years; and annual PM₁₀ compliance is based on the five year average.

3.1 Modeling Significant Impact Levels

Initial modeling will be performed to show if modeled CO, NO₂ and PM₁₀ impacts are significant. If impacts are significant, based on the highest predicted result for each pollutant and averaging interval, a full impact study must be completed, including a CAAQS and NAAQS modeling study and PSD increment consumption analysis. The modeling Significant Impact Levels (SILs) are listed in Table 4. The facility is not within 10 km of a Class I area (the closest are Redwood National Park and Marble Mountain Wilderness), so the more stringent Class I significant impact levels do not apply.

Table 4. Air Quality Significant Impact Levels

| Pollutant | 1-Hour Average ($\mu\text{g}/\text{m}^3$) | 8-Hour Average ($\mu\text{g}/\text{m}^3$) | 24-Hour Average ($\mu\text{g}/\text{m}^3$) | Annual Average ($\mu\text{g}/\text{m}^3$) |
|------------------|--|--|---|--|
| CO | 2000 | 500 | - | - |
| NO ₂ | - | - | - | 1 |
| PM ₁₀ | - | - | 5 | 1 |

3.2 PSD Increment Limits

To complete the PSD increment consumption analysis, the criteria pollutant emissions increase above the baseline level for each emission source considered in the study must be modeled as shown in Table 5. The facility is not within 10 km of a Class I area, so only the Class II increment limits will apply.

Table 5. PSD Increment Limits Class I and II Areas ($\mu\text{g}/\text{m}^3$)

| Pollutant | Averaging Time | Class I Area | Class II Area |
|------------------|----------------|--------------|---------------|
| NO ₂ | Annual | 2.5 | 25 |
| PM ₁₀ | 24-Hour | 8 | 30 |
| PM ₁₀ | Annual | 4 | 17 |

4.0 PSD AIR DISPERSION MODELING METHODOLOGY

This section describes the methodology that will be followed to complete the PSD air dispersion modeling analysis, including the Significant Impact Analysis (SIA), and if required, the full impact study.

4.1 Air Dispersion Model Selection

USEPA's preferred air dispersion models are listed in 40 CFR 51 Appendix W *Guideline on Air Quality Models*. Based on amendments to USEPA's modeling guidelines, promulgated November 9, 2005, there is a one year period for transitioning from use of the Industrial Source Complex Short Term, Version 3 (ISCST3) model to the AERMOD model. The ISCST3 model is proposed since modeling is expected to be completed within this transition period.

ISCST3 will be run in the regulatory default mode, including stack-tip downwash and buoyancy-induced dispersion. Rural dispersion coefficients are consistent with the Auer land use analysis based on a review of aerial photographs, and will be used for the project location.

4.2 Pollutants Modeled

Maximum CO, NO₂ and PM₁₀ impacts will be modeled. NO_x will be modeled for the one-hour and annual averaging periods with adjustments made to calculate NO₂ impacts. CO will be modeled for the one-hour and eight-hour averaging periods. PM₁₀ will be modeled for 24-hour and annual averaging periods.

4.3 Receptor Data

The coordinate system used in the analysis is the North American Datum 1983 (NAD83) coordinate system. A fine receptor grid with 250 meter spacing will be placed from the approximate center of the site out 10 km to the north, south, east, and west from the Blue Lake Generating Station. The grid will be used to complete the SIA modeling. If a full impact analysis is required, modeling will be completed only for receptors that are within the SIA radius.

4.4 Terrain Data

The ISCST3 model requires receptor elevations to calculate impacts in simple terrain above the stack base and in complex terrain above the stack height. Receptor elevations will be developed using 7.5-minute Digital Elevation Maps (DEM) data in the NAD83 coordinate system with 10 m or 30 m spacing.

4.5 Building Downwash

ISCST3 has the capability to account for building downwash produced by airflow over and around structures. Direction-specific building downwash parameters will be developed for input to ISCST3 using the USEPA Building Profile Input Program (BPIP). At 100 feet high, the boiler ESP stack height complies with Good Engineering Practice (GEP) guidelines. Buildings will be entered in ISCST3 if the distance from the building to any of the shorter stacks (diesel engines or cooling tower) is less than five times the lesser of the building height or projected width.

4.6 Meteorological Data Selection

To run the ISCST3 model, hourly sequential meteorological data are required. Modeling will use surface air monitoring data for Blue Lake Rancheria, from 2000 through 2004, processed with Oakland Airport upper air data.

Use of Blue Lake Rancheria data is requested under the Stipulated Order. The closest sites for upper air data are Medford, Oregon and Oakland, California. Oakland data is preferred since it more closely matches the project site's coastal environment.

4.7 Background Concentration Data

Background criteria pollutant concentration data will be required to complete the modeling analysis. Background monitoring data are shown in Table 6.

Blue Lake Rancheria is the nearest monitoring station and collects PM₁₀ data. This data will be requested from Blue Lake Rancheria and will be used if available and representative. If not available or representative, PM₁₀ data is also available at the Eureka (6th and I St) site.

Background data is limited for CO and NO₂. The only monitors within the North Coast AQMD are at Ukiah and Willits. Use of Ukiah data is proposed since it is the nearest regional monitor and is likely impacted by similar sources.

Table 6. Ambient Background Concentrations

| Pollutant | Averaging Time | Units | 2002 | 2003 | 2004 | Monitoring Station |
|------------------|----------------------|--------------------------|---------------|---------------|---------------|---------------------|
| CO | 1 hour – California | ppm µg/m ³ | 3.1 3444 | 4.8 5333 | 2.3 2556 | Ukiah |
| CO | 1 hour – Federal | ppm µg/m ³ | 3.0 3333 | 4.8 5333 | 2.0 2444 | Ukiah |
| CO | 8 hour – California | ppm µg/m ³ | 2.55 2842 | 2.18 2422 | 1.78 1978 | Ukiah |
| CO | 8 hour – Federal | ppm µg/m ³ | 1.87 2087 | 2.05 2278 | 1.65 1833 | Ukiah |
| NO ₂ | 1 hour – California | ppm µg/m ³ | 0.038 71.4 | 0.042 78.9 | 0.039 69.6 | Ukiah |
| NO ₂ | Annual – Federal | ppm µg/m ³ | 0.010 18.8 | 0.009 16.9 | 0.009 16.9 | Ukiah |
| PM ₁₀ | 24 hour – California | µg/m ³ | TBA | TBA | TBA | Blue Lake Rancheria |
| PM ₁₀ | 24 hour – Federal | µg/m ³ | TBA | TBA | TBA | Blue Lake Rancheria |
| PM ₁₀ | Annual – California | µg/m ³ | TBA | TBA | TBA | Blue Lake Rancheria |
| PM ₁₀ | Annual – Federal | µg/m ³ | TBA | TBA | TBA | Blue Lake Rancheria |

NO₂ and 8-hr CO data from www.arb.ca.gov/adam/welcome.html. 1-hr CO data from www.epa.gov/air/data/reports.html. Highest values used for California short-term background. Highest second highest values used for federal short-term background. Average values used for annual background.

TBA = To be advised

4.8 NO_x to NO₂ Concentration Adjustments

NO_x emitted from combustion sources consists of both NO and NO₂. The PSD modeling study requires NO₂ concentrations for comparison with ambient standards and increment limits. If

modeling results for NO_x exceed any applicable thresholds then appropriate conversions will be used to quantify the fraction of NO_x that is present as NO₂.

Hourly NO₂

The physical and chemical conversion of NO to NO₂ in the atmosphere is limited by the amount of time for reactions and the amount of ozone available to complete the reactions. Either the Ozone Limiting Method (OLM) (Cole & Summerhays, 1979) or the 12-minute half-life approach will be used for the short-term conversion of NO_x to NO₂.

For the OLM, NO_x emissions consist of a mixture of NO₂ and NO. Once emitted, NO is converted to NO₂ by reaction with ozone (O₃). Therefore, the amount of NO that can be converted to NO₂ is limited by the ambient ozone level. The USEPA draft guidance regarding use of the ISC-OLM model (USEPA 1997) will be followed for selected receptor locations where maximum NO_x impacts occur. Using OLM, 10 percent of NO_x emitted from the equipment will be assumed to be NO₂ initially, and 90 percent will be assumed to be NO. The remaining NO concentration will be compared to the ambient ozone concentrations. If the NO concentration is less than the ozone concentration, all NO will be assumed to convert to NO₂. Otherwise, the remaining NO will be converted to NO₂ at the ambient ozone concentration. The highest modeled NO_x impact hour and the highest ambient ozone hour will be checked.

If peak NO_x concentrations are very near the stack, the 12-minute half-life approach will be used. The 12-minute half-life approach requires ISCST3 to be run twice: once for total NO_x and a second time with a half-life of 12 minutes and a NO_x emission rate of 90 percent (assuming that the initial NO₂ plume concentration is 10 percent). The difference of the second run from the first run is the NO₂ concentration.

Annual NO₂

For long-term NO₂ concentrations, the maximum annual average NO_x concentrations from modeling will be converted to NO₂ concentrations using a default factor, 0.75, specified in the *Guideline on Air Quality Models* (40 CFR Part 51, Appendix W). For comparison to the annual standard, resulting NO₂ concentrations will be added to the NO₂ background value.

4.9 Fumigation

Inversion break-up fumigation may produce high 1-hour impacts for tall stacks located in a valley. SCREEN3 will be used to check 1-hour CO and NO_x impacts for the boiler ESP stack due to inversion break-up fumigation.

In accordance with *Screening Procedures for Estimating the Air Quality Impact* (EPA-454/R-92-019), analysis of shoreline fumigation should be performed for tall stacks located within 3 km of a large body of water. The project site is located 13 km inland and 8 km from Humboldt Bay, so shoreline fumigation is not proposed.

5.0 AIR DISPERSION MODELING ANALYSIS

A PSD air dispersion modeling analysis will be completed for the facility. As described in this section, modeling will consist of the Significant Impact Area (SIA) analysis, and if required, a Full Impact Study.

5.1 Significant Impact Area Analysis

For the SIA modeling analysis, maximum off-site one-hour and eight-hour average CO concentrations, annual NO₂ concentrations and twenty four-hour and annual PM₁₀ will be calculated from dispersion modeling and compared to the SILs. The SILs are listed in Table 4.

The SIA will be delineated based upon the furthest distance from the Facility to the location of the maximum CO, NO₂ or PM₁₀ impact that exceeds a SIL. This distance will be the radius for the SIA circle. If there is no exceedence of SILs, no further PSD modeling will be conducted.

5.2 Class II Area Full Impact Study

A Class II area full impact study will be completed for each pollutant and averaging interval with concentrations exceeding the SILs. As discussed in this section, the full impact analysis will consist of the NAAQS compliance analysis and the increment consumption analysis on pollutants that are significant.

Class II analyses will include nearby sources that might have a significant impact within the Facility SIA. Nearby sources are defined as those within 50 km of the SIA. A public record request will be submitted to the AQMD to obtain emissions data and stack parameters for nearby sources. But these sources will be screened using the Range of Influence (ROI) approach (Oregon Administrative Rules (OAR), 340, 225 (12)). This method defines ROI as:

$$\text{ROI (km)} = \text{Emission Rate (tons/yr)}/K$$

Where K = 40 for CO, 10 for NO_x, and 5 for PM₁₀.

Offsite sources will be excluded from the modeling analysis unless their ROI extends into the SIA, or:

$$\text{ROI} \geq (D - \text{SIA})$$

Where D = Distance from Ultrapower 3 to the nearby source, and
SIA = Radius of Significant Impact Area.

5.3 NAAQS Compliance Analysis

To complete the NAAQS compliance analysis, the Facility CO, NO₂ or PM₁₀ emissions will be modeled if impacts are significant. The analysis will include any nearby sources that might have a significant impact within the Facility SIA. Background concentrations will be added to the

maximum modeled CO, NO₂ and PM₁₀ concentrations for the facility and any nearby sources. The total resulting values will be compared to the NAAQS and CAAQS.

5.4 PSD Increment Consumption Analysis

To complete the PSD increment consumption analysis, the Facility NO₂ and PM₁₀ emissions will be modeled along with the increase above the PSD baseline for any nearby sources that might have a significant impact within the Facility SIA. The Class II PSD increment limit for NO₂ is 25 µg/m³ for the annual averaging period. The Class II PSD increment limit for PM₁₀ is 30 µg/m³ for the twenty four-hour averaging period, and 17 µg/m³ for the annual averaging period.

5.5 Class I Area Analysis

Two Federal Class I areas are located within about 100 km of the Ultrapower 3 facility. These are the Redwood National Park (16 km to the north) and the Marble Mountain Wilderness (75 km to the northeast). Yolla Bolly Middle Eel Wilderness is located 115 km to the southeast. Figure 2 shows the Class 1 areas in California.

A screening analysis using the CALPUFF Lite modeling system is proposed to assess project impacts at the nearest Class 1 area, Redwood National Park. The methodology will follow the USEPA Screening Methodology for Class 1 Areas (USEPA, 1998). This methodology is conservative. It is referred to as CALPUFF-Lite because it by-passes the need to generate a full three-dimensional wind field with CALMET. Instead a single station meteorological field is used (Blue Lake Rancheria meteorological data).

5.5.1 Grid Settings

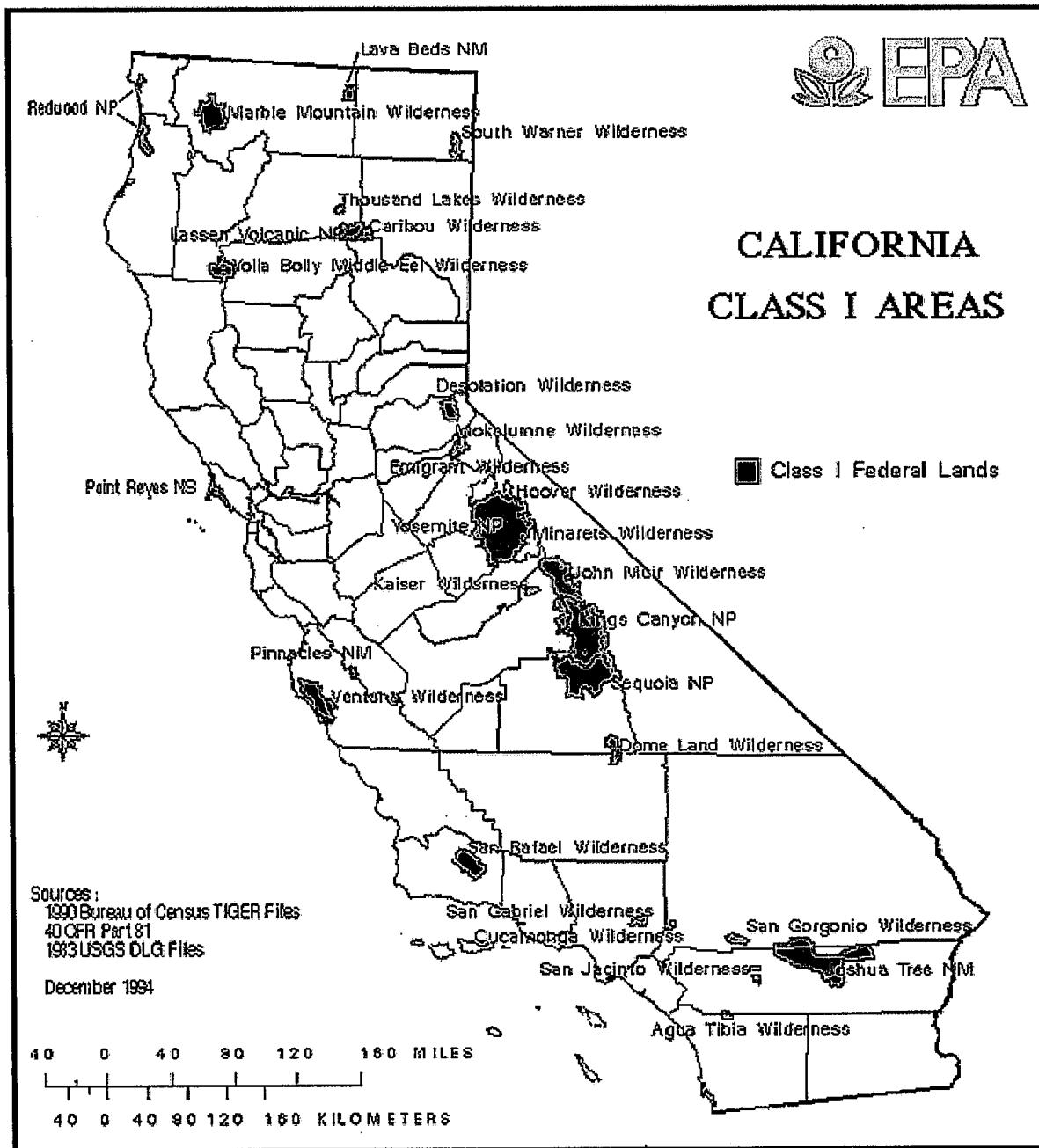
Meteorological data from a single ISC-type meteorological data file requires no spatial variation in meteorological or geophysical properties, so the minimum grid cell configuration (NX=2, NY=2, NZ=1). The upper cell face height will be set above the maximum expected mixing height, at 5,000 meters. The cell size will be set to the distance of the farthest point of the Redwood National Park (95 km) plus 50 km, or 145 km. The puff mode will be used, and terrain effects will be simulated using the partial plume path adjustment method. Other grid variables will be set in accordance to the methodology.

5.5.2 Pollutant Modeling

Chemical property information will be obtained using the MESOPUFF II library, included in the CALPUFF-Lite modeling system. Chemical transformation will follow the MESOPUFF II scheme, using constant background concentrations of ozone and ammonia. Default nighttime conversion rates (SO₂ loss rate=0.2%/hr, NO_x loss rate=2%/hr, and HNO₃ formation rate=2%/hr) will be used.

Dry deposition will be invoked in the gas-phase mode for SO₂, NO_x and HNO₃ and in the particle phase mode for SO₄ and NO₃. Wet deposition will be activated for SO₂, SO₄, HNO₃ and NO₃. All advanced variables will be set to the model default settings.

Figure 2. California Class I Areas



All emission sources are point sources. Momentum flux will be set to 1.0 for vertical sources and 0.0 for capped sources. Downwash will not be applied since the Class 1 areas are outside the zone where downwash would occur.

5.5.3 Receptors

Receptor rings at 1 degree spacing will be placed at the nearest and farthest boundaries of the Redwood National Park. The average elevation of each boundary will be used for the ring elevation.

5.5.4 Post Processing

The POSTUTIL application will be run for each of the five years of meteorological data processed. The deposition flux of sulfates and nitrates, and impacts on Air Quality Related Values (AQRVs) and visibility will be calculated using CALPOST. The peak total nitrogen deposition flux and annual extinction will be computed and compared with significance values.

6.0 HEALTH RISK ASSESSMENT METHODOLOGY

This section describes the methodology that will be followed to complete the HRA. Methodology will follow OEHHA's *Air Toxics Program Risk Assessment Guidelines* (August 2003).

6.1 Pollutants Modeled

Air toxics emissions have been calculated for the wood and propane combustion in the boiler, and diesel combustion in the emergency water pump and emergency generator. Air toxics emissions from the cooling tower are assumed negligible. Air toxic emissions are provided in Appendix A.

Wood Combustion

Maximum hourly and annual emissions for wood combustion are calculated from the boiler rating of 185 MMBtu/hr and 8,760 hours per year. Organic air toxic emissions are quantified using CARB's California Air Toxic Emission Factor (CATEF) database mean values for wood fired boilers (Source Classification Code 10100903). CATEF does not include inorganic emission factors specific to this process and control device, so inorganic emission factors are quantified using AP-42 Section 1.6 emission factors.

Propane Combustion

Maximum hourly emissions for propane combustion are based on the burner rating of 80 MMBtu/hr. Annual emissions for propane combustion are based on the permit limit of 1.78 million gallons per year. Emission factors are based on Ventura County air toxic emission factors (natural gas, external combustion, 10 to 100 MMBtu/hr), converted based on 1,000 Btu per scf natural gas and 90,000 Btu per gallon propane.

Diesel Internal Combustion

Maximum hourly emissions for diesel combustion are based on the engine rating. Annual emissions are based on 20 hours per year for maintenance and testing (as limited by the California Air Toxics Control Measure for diesel particulate matter from stationary engines). Air toxic emissions are collectively quantified as diesel particulate matter, using AP-42 Section 3.3 emission factors.

6.2 Dispersion Analysis

Both air dispersion modeling and exposure assessment will be performed using CARB's HotSpots Analysis and Reporting Program (HARP). HARP incorporates the ISCST3 air dispersion model. Air dispersion modeling will be performed using the same control parameters, procedures, and meteorological data as discussed above for the AQIA and PSD modeling.

The receptor grid will cover the zone of impact that defines the area with cancer risk greater than 1 in one million and non-cancer risks with a hazard index greater than 1.0. Modeling with receptor spacing of 100 meters out to 2 km and 250 meters beyond 2 km will identify points of peak risks. Sensitive receptors will be identified within any area identified above significance thresholds. Census centroid receptors will be added for locations within the zone of impact, identified above the significance threshold for cancer in order to quantify cancer burden.

6.3 Exposure Assessment

Exposure assessment will be calculated by HARP from the ISCST3 output. HARP offers several alternatives for exposure calculations. In accordance with CARB interim guidelines (October 9, 2003), for cancer risk, the risk assessment will present Derived (OEHHA) Calculations and Derived (Adjusted) Calculations. For chronic non-cancer exposure, the risk assessment will present Derived (OEHHA) Calculations. Acute non-cancer exposure will be calculated using the HARP default method.

Risks for residential receptors will consider exposure through inhalation, soil ingestion, dermal, homegrown vegetables, and mother's milk pathways. Risks for worker receptors will consider exposure through inhalation, soil, and dermal pathways.

Drinking water, fish, and livestock pathways are not proposed to be included.

The drinking water pathway is not expected to be significant since reservoirs used by the Humboldt Bay Municipal Water District are all located considerable distance from the facility – 73 km to Ruth Lake, 5 km to Essex, and 7 km to Korblex. The Mad River flows near the facility; however, any pollutant concentration would be extremely dilute based on the high turnover versus surface area of a river.

The fish pathway is not expected to be significant due to the dilute concentration of pollutants in the Mad River and the limited fraction of diet that would be expected to come from this source.

Locally raised livestock are not expected to be a significant pathway due to the limited fraction of diet that would be expected to come from this source.

6.4 Health Risk Factors

Health risks will be quantified by HARP using current risk factors available on the CARB web site (www.arb.ca.gov/toxics/harp/harpdownload.htm). Most recently available data is current through September 21, 2004.

7.0 CONCLUSION

Ultrapower 3, SCS and BlueScape Environmental have provided an AQIA/PSD Modeling Protocol for CO, NO_x and PM₁₀ emissions and an HRA Modeling Protocol for air toxic emissions. Upon review, comment and approval of these modeling protocols by AQMD, the formal air dispersion modeling report and HRA will be prepared and submitted to AQMD staff.

Appendix A

Emission Rate Calculations

Blue Lake Generating Station Ultrapower 3
Boiler - Wood Emissions

Rating : 185 MMBTU/hr
Annual Operation : 8760 hr/yr
Wood GHV : 7200 BTU/lb

12.847 ton/hr
112,542 ton/yr

| Pollutant | Emission Factor Source | CAS Number | OEHHA Listed Air Toxic | Uncontrolled Emission Factor (lb/MMBtu) | Element/Oxide Conversion (b) | Uncontrolled Emission Factor lb/ton | Control Efficiency | Controlled Emission Factor lb/ton | Uncontrolled Emission Rate (lb/hr) | Controlled Emission Rate (lb/hr) | Controlled Emission Rate (lb/yr) | Controlled Emission Rate (tpy) |
|---|------------------------|------------|------------------------|---|------------------------------|-------------------------------------|--------------------|-----------------------------------|------------------------------------|----------------------------------|----------------------------------|--------------------------------|
| CO | AP-42 (a) | | | 1 | | 1.440E+01 | 0 | 1.440E+01 | 185.00 | 185.00 | 1,620,600 | 810.30 |
| NOx | AP-42 (a) | | | 0.15 | | 2.160E+00 | 0 | 2.160E+00 | 27.75 | 27.75 | 243,090 | 121.55 |
| PM10 | AP-42 (a) | | | 0.04 | | 5.760E-01 | 0 | 5.760E-01 | 7.40 | 7.40 | 64,824 | 32.41 |
| SOx | AP-42 (a) | | | 0.025 | | 3.600E-01 | 0 | 3.600E-01 | 4.63 | 4.63 | 40,515 | 20.26 |
| Inorganic Compounds | | | | | | | | | | | | |
| Antimony | AP-42 (a) | 7440-36-0 | Yes | 7.90E-06 | 1 | 1.138E-04 | 98 | 2.275E-06 | 1.46E-03 | 2.92E-05 | 2.56E-01 | 1.28E-04 |
| Arsenic | AP-42 (a) | 7440-38-2 | Yes | 2.20E-05 | 1 | 3.168E-04 | 98 | 6.336E-06 | 4.07E-03 | 8.14E-05 | 7.13E-01 | 3.57E-04 |
| Barium | AP-42 (a) | 7440-39-3 | Yes | 1.70E-04 | 1 | 2.448E-03 | 98 | 4.896E-05 | 3.15E-02 | 6.29E-04 | 5.51E+00 | 2.76E-03 |
| Beryllium | AP-42 (a) | 7440-41-7 | Yes | 1.10E-06 | 1 | 1.584E-05 | 98 | 3.168E-07 | 2.04E-04 | 4.07E-06 | 3.57E-02 | 1.78E-05 |
| Cadmium | AP-42 (a) | 7440-43-9 | Yes | 4.10E-06 | 1 | 5.904E-05 | 98 | 1.181E-06 | 7.59E-04 | 1.52E-05 | 1.33E-01 | 6.64E-05 |
| Chlorine | AP-42 (a) | 7782-50-5 | Yes | 7.90E-04 | 1 | 1.138E-02 | 0 | 1.138E-02 | 1.46E-01 | 1.46E-01 | 1.28E+03 | 6.40E-01 |
| Chromium Total | AP-42 (a) | 7440-47-3 | Yes | 2.10E-05 | 1 | 3.024E-04 | 98 | 6.048E-06 | 3.89E-03 | 7.77E-05 | 6.81E-01 | 3.40E-04 |
| Chromium hexavalent | AP-42 (a) | 18540-29-9 | Yes | 3.50E-06 | 1 | 5.040E-05 | 98 | 1.008E-06 | 6.48E-04 | 1.30E-05 | 1.13E-01 | 5.67E-05 |
| Cobalt | AP-42 (a) | 7440-48-4 | Yes | 6.50E-06 | 1 | 9.360E-05 | 98 | 1.872E-06 | 1.20E-03 | 2.41E-05 | 2.11E-01 | 1.05E-04 |
| Copper | AP-42 (a) | 1317-38-0 | Yes | 4.90E-05 | 1 | 7.056E-04 | 98 | 1.411E-05 | 9.07E-03 | 1.81E-04 | 1.59E+00 | 7.94E-04 |
| Hydrogen chloride | AP-42 (a) | 7647-01-0 | Yes | 1.90E-02 | 1 | 2.736E-01 | 0 | 2.736E-01 | 3.52E+00 | 3.52E+00 | 30791 | 15.40 |
| Iron Oxide | AP-42 (a) | 1309-37-1 | No | 9.90E-04 | 1.43 | 2.039E-02 | 98 | 4.077E-04 | 2.62E-01 | 5.24E-03 | 4.59E+01 | 2.29E-02 |
| Lead | AP-42 (a) | 7439-92-1 | Yes | 4.80E-05 | 1 | 6.912E-04 | 98 | 1.382E-05 | 8.88E-03 | 1.78E-04 | 1.56E+00 | 7.78E-04 |
| Manganese | AP-42 (a) | 7439-96-5 | Yes | 1.60E-03 | 1 | 2.304E-02 | 98 | 4.608E-04 | 2.96E-01 | 5.92E-03 | 5.19E+01 | 2.59E-02 |
| Mercury | AP-42 (a) | 7439-97-6 | Yes | 3.50E-06 | 1 | 5.040E-05 | 0 | 5.040E-05 | 6.48E-04 | 6.48E-04 | 5.67E+00 | 2.84E-03 |
| Molybdenum Trioxide (MoO ₃) | AP-42 (a) | 1313-27-5 | Yes | 2.10E-06 | 1.30 | 3.931E-05 | 98 | 7.862E-07 | 5.05E-04 | 1.01E-05 | 8.85E-02 | 4.42E-05 |
| Nickel | AP-42 (a) | 7440-02-0 | Yes | 3.30E-05 | 1 | 4.752E-04 | 98 | 9.504E-06 | 6.11E-03 | 1.22E-04 | 1.07E+00 | 5.35E-04 |
| Phosphorus | AP-42 (a) | 7723-14-0 | Yes | 2.70E-05 | 1 | 3.888E-04 | 98 | 7.776E-06 | 5.00E-03 | 9.99E-05 | 8.75E-01 | 4.38E-04 |
| Potassium | AP-42 (a) | | No | 3.90E-02 | 1 | 5.616E-01 | 98 | 1.123E-02 | 7.22E+00 | 1.44E-01 | 1.26E+03 | 6.32E-01 |
| Selenium | AP-42 (a) | 7782-49-2 | Yes | 2.80E-06 | 1 | 4.032E-05 | 0 | 4.032E-05 | 5.18E-04 | 5.18E-04 | 4.54E+00 | 2.27E-03 |
| Silver | AP-42 (a) | 7440-22-4 | Yes | 1.70E-03 | 1 | 2.448E-02 | 0 | 2.448E-02 | 3.15E-01 | 3.15E-01 | 2755 | 1.38 |
| Sodium | AP-42 (a) | | No | 3.60E-04 | 1 | 5.184E-03 | 98 | 1.037E-04 | 6.66E-02 | 1.33E-03 | 1.17E+01 | 5.83E-03 |
| Strontium | AP-42 (a) | 1314-11-0 | No | 1.00E-05 | 1 | 1.440E-04 | 98 | 2.880E-06 | 1.85E-03 | 3.70E-05 | 3.24E-01 | 1.62E-04 |
| Tin | AP-42 (a) | 18282-10-5 | No | 2.30E-05 | 1 | 3.312E-04 | 98 | 6.624E-06 | 4.26E-03 | 8.51E-05 | 7.45E-01 | 3.73E-04 |
| Titanium | AP-42 (a) | 13463-67-7 | No | 2.00E-05 | 1 | 2.880E-04 | 98 | 5.760E-06 | 3.70E-03 | 7.40E-05 | 6.48E-01 | 3.24E-04 |
| Vanadium | AP-42 (a) | 7440-62-2 | Yes | 9.80E-07 | 1 | 1.411E-05 | 98 | 2.822E-07 | 1.81E-04 | 3.63E-06 | 3.18E-02 | 1.59E-05 |
| Yttrium | AP-42 (a) | 1314-36-9 | No | 3.00E-07 | 1 | 4.320E-06 | 98 | 8.640E-08 | 5.55E-05 | 1.11E-06 | 9.72E-03 | 4.86E-06 |
| Zinc | AP-42 (a) | 7440-66-6 | Yes | 4.20E-04 | 1 | 6.048E-03 | 98 | 1.210E-04 | 7.77E-02 | 1.55E-03 | 1.36E+01 | 6.81E-03 |
| Organic Compounds | | | | | | | | | | | | |
| 2-Methylnaphthalene | CATEF (b) | 91-57-6 | No | 2.28E-08 | | 3.290E-07 | 0 | 3.290E-07 | 4.23E-06 | 4.23E-06 | 3.70E-02 | 1.85E-05 |
| Acenaphthene | CATEF (b) | 83-32-9 | Yes | 2.58E-08 | | 3.720E-07 | 0 | 3.720E-07 | 4.78E-06 | 4.78E-06 | 4.19E-02 | 2.09E-05 |
| Acenaphthylene | CATEF (b) | 208-96-8 | Yes | 1.51E-08 | | 2.170E-07 | 0 | 2.170E-07 | 2.79E-06 | 2.79E-06 | 2.44E-02 | 1.22E-05 |
| Acetaldehyde | CATEF (b) | 75-07-0 | Yes | 7.15E-05 | | 1.030E-03 | 0 | 1.030E-03 | 1.32E-02 | 1.32E-02 | 1.16E+02 | 5.80E-02 |
| Acrolein | CATEF (b) | 107-02-8 | Yes | 3.63E-06 | | 5.230E-05 | 0 | 5.230E-05 | 6.72E-04 | 6.72E-04 | 5.89E+00 | 2.94E-03 |
| Anthracene | CATEF (b) | 120-12-7 | Yes | 2.13E-08 | | 3.070E-07 | 0 | 3.070E-07 | 3.94E-06 | 3.94E-06 | 3.46E-02 | 1.73E-05 |
| Benzene | CATEF (b) | 71-43-2 | Yes | 1.03E-05 | | 1.490E-04 | 0 | 1.490E-04 | 1.91E-03 | 1.91E-03 | 1.68E+01 | 8.38E-03 |
| Benz(a)anthracene | CATEF (b) | 56-55-6 | No | 7.64E-10 | | 1.100E-08 | 0 | 1.100E-08 | 1.41E-07 | 1.41E-07 | 1.24E-03 | 6.19E-07 |
| Benz(a)pyrene | CATEF (b) | 50-32-8 | Yes | 7.64E-10 | | 1.100E-08 | 0 | 1.100E-08 | 1.41E-07 | 1.41E-07 | 1.24E-03 | 6.19E-07 |
| Benz(b)fluoranthene | CATEF (b) | 205-99-2 | Yes | 1.46E-09 | | 2.100E-08 | 0 | 2.100E-08 | 2.70E-07 | 2.70E-07 | 2.36E-03 | 1.18E-06 |
| Benz(e)pyrene | CATEF (b) | 192-97-2 | Yes | 2.84E-09 | | 4.090E-08 | 0 | 4.090E-08 | 5.25E-07 | 5.25E-07 | 4.60E-03 | 2.30E-06 |
| Benz(g,h,i)perylene | CATEF (b) | 191-24-2 | Yes | 9.10E-10 | | 1.310E-08 | 0 | 1.310E-08 | 1.68E-07 | 1.68E-07 | 1.47E-03 | 7.37E-07 |
| Benz(k)fluoranthene | CATEF (b) | 207-08-9 | Yes | 7.64E-10 | | 1.100E-08 | 0 | 1.100E-08 | 1.41E-07 | 1.41E-07 | 1.24E-03 | 6.19E-07 |
| Chrysene | CATEF (b) | 218-01-9 | Yes | 5.63E-09 | | 8.100E-08 | 0 | 8.100E-08 | 1.04E-06 | 1.04E-06 | 9.12E-03 | 4.56E-06 |
| Dibenzo(a,h)anthracene | CATEF (b) | 53-70-3 | No | 7.64E-10 | | 1.100E-08 | 0 | 1.100E-08 | 1.41E-07 | 1.41E-07 | 1.24E-03 | 6.19E-07 |
| Dioxin;4D 2378 | CATEF (b) | 1746-01-6 | Yes | 4.69E-13 | | 6.760E-12 | 0 | 6.760E-12 | 8.68E-11 | 8.68E-11 | 7.61E-07 | 3.80E-10 |

Blue Lake Generating Station Ultrapower 3
Boiler - Wood Emissions

| Pollutant | Emission Factor Source | CAS Number | OEHHA Listed Air Toxic | Uncontrolled Emission Factor (lb/MMBtu) | Element/ Oxide Conversion (b) | Uncontrolled Emission Factor lb/ton | Control Efficiency | Controlled Emission Factor lb/ton | Uncontrolled Emission Rate (lb/hr) | Controlled Emission Rate (lb/hr) | Controlled Emission Rate (lb/yr) | Controlled Emission Rate (tpy) |
|--------------------------------|------------------------|------------|------------------------|---|-------------------------------|-------------------------------------|--------------------|-----------------------------------|------------------------------------|----------------------------------|----------------------------------|--------------------------------|
| Dioxin:4D Total | CATEF (b) | 41903-57-5 | Yes | 8.13E-11 | | 1.170E-09 | 0 | 1.170E-09 | 1.50E-08 | 1.50E-08 | 1.32E-04 | 6.58E-08 |
| Dioxin:5D 12378 | CATEF (b) | 40321-76-4 | Yes | 1.09E-12 | | 1.570E-11 | 0 | 1.570E-11 | 2.02E-10 | 2.02E-10 | 1.77E-06 | 8.83E-10 |
| Dioxin:5D Total | CATEF (b) | 36088-22-9 | Yes | 6.90E-11 | | 9.940E-10 | 0 | 9.940E-10 | 1.28E-08 | 1.28E-08 | 1.12E-04 | 5.59E-08 |
| Dioxin:6D 123478 | CATEF (b) | 39227-28-6 | Yes | 1.78E-12 | | 2.560E-11 | 0 | 2.560E-11 | 3.29E-10 | 3.29E-10 | 2.88E-06 | 1.44E-09 |
| Dioxin:6D 123678 | CATEF (b) | 57653-85-7 | Yes | 2.60E-12 | | 3.740E-11 | 0 | 3.740E-11 | 4.80E-10 | 4.80E-10 | 4.21E-06 | 2.10E-09 |
| Dioxin:6D 123789 | CATEF (b) | 19408-74-3 | Yes | 1.83E-12 | | 2.640E-11 | 0 | 2.640E-11 | 3.39E-10 | 3.39E-10 | 2.97E-06 | 1.49E-09 |
| Dioxin:6D Total | CATEF (b) | 34465-46-8 | Yes | 1.89E-10 | | 2.720E-09 | 0 | 2.720E-09 | 3.49E-08 | 3.49E-08 | 3.06E-04 | 1.53E-07 |
| Dioxin:7D 1234678 | CATEF (b) | 35822-46-9 | Yes | 3.99E-11 | | 5.740E-10 | 0 | 5.740E-10 | 7.37E-09 | 7.37E-09 | 6.46E-05 | 3.23E-08 |
| Dioxin:7D Total | CATEF (b) | 37871-00-4 | Yes | 7.50E-11 | | 1.080E-09 | 0 | 1.080E-09 | 1.39E-08 | 1.39E-08 | 1.22E-04 | 6.08E-08 |
| Dioxin:8D | CATEF (b) | 3268-87-9 | Yes | 5.46E-10 | | 7.860E-09 | 0 | 7.860E-09 | 1.01E-07 | 1.01E-07 | 8.85E-04 | 4.42E-07 |
| Fluoranthene | CATEF (b) | 206-44-0 | Yes | 6.85E-08 | | 9.860E-07 | 0 | 9.860E-07 | 1.27E-05 | 1.27E-05 | 1.11E-01 | 5.55E-05 |
| Fluorene | CATEF (b) | 86-73-7 | Yes | 4.72E-08 | | 6.790E-07 | 0 | 6.790E-07 | 8.72E-06 | 8.72E-06 | 7.64E-02 | 3.82E-05 |
| Formaldehyde | CATEF (b) | 50-00-0 | Yes | 4.54E-05 | | 6.540E-04 | 0 | 6.540E-04 | 8.40E-03 | 8.40E-03 | 7.36E+01 | 3.68E-02 |
| Furan:4F 2378 | CATEF (b) | 51207-31-9 | Yes | 2.60E-12 | | 3.740E-11 | 0 | 3.740E-11 | 4.80E-10 | 4.80E-10 | 4.21E-06 | 2.10E-09 |
| Furan:4F Total | CATEF (b) | 55722-27-5 | Yes | 6.77E-11 | | 9.750E-10 | 0 | 9.750E-10 | 1.25E-08 | 1.25E-08 | 1.10E-04 | 5.49E-08 |
| Furan:5F 12378 | CATEF (b) | 57114-41-6 | Yes | 1.56E-12 | | 2.240E-11 | 0 | 2.240E-11 | 2.88E-10 | 2.88E-10 | 2.52E-06 | 1.26E-09 |
| Furan:5F 23478 | CATEF (b) | 5711-31-4 | Yes | 1.78E-12 | | 2.570E-11 | 0 | 2.570E-11 | 3.30E-10 | 3.30E-10 | 2.89E-06 | 1.45E-09 |
| Furan:5F Total | CATEF (b) | 30402-15-4 | Yes | 2.56E-11 | | 3.690E-10 | 0 | 3.690E-10 | 4.74E-09 | 4.74E-09 | 4.15E-05 | 2.08E-08 |
| Furan:6F 123478 | CATEF (b) | 70648-26-9 | Yes | 1.86E-12 | | 2.680E-11 | 0 | 2.680E-11 | 3.44E-10 | 3.44E-10 | 3.02E-06 | 1.51E-09 |
| Furan:6F 123678 | CATEF (b) | 57117-44-9 | Yes | 1.89E-12 | | 2.720E-11 | 0 | 2.720E-11 | 3.49E-10 | 3.49E-10 | 3.06E-06 | 1.53E-09 |
| Furan:6F 123789 | CATEF (b) | 72918-21-9 | Yes | 5.78E-13 | | 8.320E-12 | 0 | 8.320E-12 | 1.07E-10 | 1.07E-10 | 9.36E-07 | 4.68E-10 |
| Furan:6F 234678 | CATEF (b) | 60851-34-5 | Yes | 2.18E-12 | | 3.140E-11 | 0 | 3.140E-11 | 4.03E-10 | 4.03E-10 | 3.53E-06 | 1.77E-09 |
| Furan:6F Total | CATEF (b) | 55684-94-1 | Yes | 1.85E-11 | | 2.670E-10 | 0 | 2.670E-10 | 3.43E-09 | 3.43E-09 | 3.00E-05 | 1.50E-08 |
| Furan:7F 1234678 | CATEF (b) | 67562-39-4 | Yes | 1.38E-11 | | 1.980E-10 | 0 | 1.980E-10 | 2.54E-09 | 2.54E-09 | 2.23E-05 | 1.11E-08 |
| Furan:7F 1234789 | CATEF (b) | 55673-89-7 | Yes | 1.13E-12 | | 1.630E-11 | 0 | 1.630E-11 | 2.09E-10 | 2.09E-10 | 1.83E-06 | 9.17E-10 |
| Furan:7F Total | CATEF (b) | 38998-75-3 | Yes | 2.60E-11 | | 3.750E-10 | 0 | 3.750E-10 | 4.82E-09 | 4.82E-09 | 4.22E-05 | 2.11E-08 |
| Furan:8F | CATEF (b) | 39001-02-0 | Yes | 3.42E-11 | | 4.920E-10 | 0 | 4.920E-10 | 6.32E-09 | 6.32E-09 | 5.54E-05 | 2.77E-08 |
| Indeno(1,2,3,c,d)pyrene | CATEF (b) | 193-20-3 | Yes | 1.58E-09 | | 2.280E-08 | 0 | 2.280E-08 | 2.93E-07 | 2.93E-07 | 2.57E-03 | 1.28E-06 |
| Naphthalene | CATEF (b) | 91-20-3 | Yes | 1.58E-06 | | 2.280E-05 | 0 | 2.280E-05 | 2.93E-04 | 2.93E-04 | 2.57E+00 | 1.28E-03 |
| PCB:Decachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 2.24E-11 | | 3.230E-10 | 0 | 3.230E-10 | 4.15E-09 | 4.15E-09 | 3.64E-05 | 1.82E-08 |
| PCB:Dichlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 6.09E-10 | | 8.770E-09 | 0 | 8.770E-09 | 1.13E-07 | 1.13E-07 | 9.87E-04 | 4.93E-07 |
| PCB:Heptachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 8.82E-11 | | 1.270E-09 | 0 | 1.270E-09 | 1.63E-08 | 1.63E-08 | 1.43E-04 | 7.15E-08 |
| PCB:Hexachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 3.57E-10 | | 5.140E-09 | 0 | 5.140E-09 | 6.60E-08 | 6.60E-08 | 5.78E-04 | 2.89E-07 |
| PCB:Monochlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 2.70E-10 | | 3.890E-09 | 0 | 3.890E-09 | 5.00E-08 | 5.00E-08 | 4.38E-04 | 2.19E-07 |
| PCB:Nonachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 7.22E-12 | | 1.040E-10 | 0 | 1.040E-10 | 1.34E-09 | 1.34E-09 | 1.17E-05 | 5.85E-09 |
| PCB:Octachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 1.22E-11 | | 1.750E-10 | 0 | 1.750E-10 | 2.25E-09 | 2.25E-09 | 1.97E-05 | 9.85E-09 |
| PCB:Pentachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 7.99E-10 | | 1.150E-08 | 0 | 1.150E-08 | 1.48E-07 | 1.48E-07 | 1.29E-03 | 6.47E-07 |
| PCB:Tetrachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 1.98E-09 | | 2.850E-08 | 0 | 2.850E-08 | 3.66E-07 | 3.66E-07 | 3.21E-03 | 1.60E-06 |
| PCB:Trichlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 2.19E-09 | | 3.160E-08 | 0 | 3.160E-08 | 4.06E-07 | 4.06E-07 | 3.56E-03 | 1.78E-06 |
| Subtotal PCB's | CATEF (b) | 1336-36-3 | Yes | 6.34E-09 | | 9.13E-08 | 0 | 9.127E-08 | 1.17E-06 | 1.17E-06 | 1.03E-02 | 5.14E-06 |
| Perylene | CATEF (b) | 198-55-0 | Yes | 7.64E-10 | | 1.100E-08 | 0 | 1.100E-08 | 1.41E-07 | 1.41E-07 | 1.24E-03 | 6.19E-07 |
| Phenanthrene | CATEF (b) | 85-01-8 | Yes | 1.44E-07 | | 2.080E-06 | 0 | 2.080E-06 | 2.67E-05 | 2.67E-05 | 2.34E-01 | 1.17E-04 |
| Pyrene | CATEF (b) | 129-00-0 | Yes | 3.81E-08 | | 5.480E-07 | 0 | 5.480E-07 | 7.04E-06 | 7.04E-06 | 6.17E-02 | 3.08E-05 |
| Toluene | CATEF (b) | 108-88-3 | Yes | 1.18E-05 | | 1.700E-04 | 0 | 1.700E-04 | 2.18E-03 | 2.18E-03 | 1.91E+01 | 9.57E-03 |
| Vinyl Chloride | CATEF (b) | 75-01-4 | Yes | 1.09E-05 | | 1.570E-04 | 0 | 1.570E-04 | 2.02E-03 | 2.02E-03 | 1.77E+01 | 8.83E-03 |
| Xylene | CATEF (b) | 1330-20-7 | Yes | 1.11E-05 | | 1.600E-04 | 0 | 1.600E-04 | 2.06E-03 | 2.06E-03 | 1.80E+01 | 9.00E-03 |

(a) Emission factors for inorganic air toxics are from AP-42 Section 1.6.

(b) Emission factors for organic air toxics are from CARB's CATEF database, Source Classification Code 10100903.

Modeled Emission Rate

CO

NOx

PM10

Max Hour (g/s) Annual (g/s)

23.31

3.4965

0.9324

December 13, 2005

Blue Lake Generating Station Ultrapower 3
Boiler - Propane Combustion

| | | | | | |
|-------------|--------------------|------------------------|-----------------------|--|--|
| Rating | 80 (MMBTU/hr) | | | | |
| Propane GHV | 90000 (BTU/gal) | | | | |
| Propane Use | 888.89 (gal/hr) | 0.88889 (1000 gal/hr) | Based on Rating | | |
| Propane Use | 21,333 (gal/day) | 21.333 (1000 gal/day) | Based on Rating | | |
| Propane Use | 1,780,000 (gal/yr) | 1,780.00 (1000 gal/yr) | Based on Permit Limit | | |

| Pollutant | | Emission Factor (lb/1000 gal) (a) | Emission (lb/hr) | Emission (lb/day) | Emission (lb/yr) | Emission (tpy) |
|------------------|--|--------------------------------------|---------------------|----------------------|---------------------|-------------------|
| CO | | 3.2 | 2.8444 | 68.267 | 5696.0 | 2.85 |
| NOx | | 19 | 16.8889 | 405.333 | 33820.0 | 16.91 |
| PM ₁₀ | | 0.6 | 0.5333 | 12.800 | 1068.0 | 0.53 |
| SOx | | 0.018 | 0.0160 | 0.384 | 32.0 | 0.02 |

| | Emission Factor Natural Gas (lb/MMCF) (b) | Emission Factor Propane (lb/1000 gal) | Emission (lb/hr) | Emission (lb/day) | Emission (lb/yr) | Emission (tpy) |
|----------------|---|---|---------------------|----------------------|---------------------|-------------------|
| Benzene | 0.0058 | 0.000522 | 4.640E-04 | 1.114E-02 | 0.929 | 0.000465 |
| Formaldehyde | 0.0123 | 0.001107 | 9.840E-04 | 2.362E-02 | 1.970 | 0.000985 |
| Benzo(a)pyrene | 0.0001 | 0.000009 | 8.000E-06 | 1.920E-04 | 0.016 | 0.000008 |
| Naphthalene | 0.0003 | 0.000027 | 2.400E-05 | 5.760E-04 | 0.048 | 0.000024 |
| Acetaldehyde | 0.0031 | 0.000279 | 2.480E-04 | 5.952E-03 | 0.497 | 0.000248 |
| Acrolein | 0.0027 | 0.000243 | 2.160E-04 | 5.184E-03 | 0.433 | 0.000216 |
| Propylene | 0.5300 | 0.047700 | 4.240E-02 | 1.018E+00 | 84.906 | 0.042453 |
| Toluene | 0.0265 | 0.002385 | 2.120E-03 | 5.088E-02 | 4.245 | 0.002123 |
| Xylenes | 0.0197 | 0.001773 | 1.576E-03 | 3.782E-02 | 3.156 | 0.001578 |
| Ethyl Benzene | 0.0069 | 0.000621 | 5.520E-04 | 1.325E-02 | 1.105 | 0.000553 |
| Hexane | 0.0046 | 0.000414 | 3.680E-04 | 8.832E-03 | 0.737 | 0.000368 |

References

- (a) AP-42 Section 1.6
(b) Ventura County Emission Factors for Natural Gas (10 - 100 MMBTU/hr), converted based on 1000 BTU/cf natural gas and 90,000 BTU/gal Propane

| Modeled Emission Rate (Propane) | Max Hour (g/s) | Max Day (g/s) | Annual (g/s) |
|---------------------------------|----------------|---------------|--------------|
| CO | 0.3584 | | |
| NOx | 2.128 | | 0.486452 |
| PM10 | | 0.0672 | 0.015362 |
| Modeled Emission Rate (Wood) | Max Hour (g/s) | Max Day (g/s) | Annual (g/s) |
| CO | 23.31 | | |
| NOx | 3.4965 | | 3.496500 |
| PM10 | | 0.9324 | 0.932400 |
| Modeled Emission Rate (Total) | Max Hour (g/s) | Max Day (g/s) | Annual (g/s) |
| CO | 23.6684 | | |
| NOx | 5.6245 | | 3.982952 |
| PM10 | | 0.9996 | 0.947762 |

**Blue Lake Generating Station Ultrapower 3
Diesel Engines**

| Device | Operation | | |
|---------------------|-----------|----------|-------------|
| | (hp) | (hr/day) | (hr/yr) (b) |
| Boiler Water Pump | 125 | 1 | 20 |
| Emergency Generator | 335.25 | 1 | 20 |

| Device | Emission Factor (lb/hp-hr) (c) | | | | Emission Rate (lb/hr) | | | | Emission Rate (lb/day) | | | | Emission Rate (tons/year) | | | |
|---------------------|--------------------------------|---------|--------|---------|-----------------------|-------|-------|-------|------------------------|-------|-------|-------|---------------------------|-------|-------|-------|
| | NOx | CO | PM10 | SOx | NOx | CO | PM10 | SOx | NOx | CO | PM10 | SOx | NOx | CO | PM10 | SOx |
| Boiler water pump | 0.031 | 0.00668 | 0.0022 | 0.00205 | 3.875 | 0.835 | 0.275 | 0.256 | 3.875 | 0.835 | 0.275 | 0.256 | 0.039 | 0.008 | 0.003 | 0.003 |
| Emergency generator | 0.031 | 0.00668 | 0.0022 | 0.00205 | 10.393 | 2.239 | 0.738 | 0.687 | 10.393 | 2.239 | 0.738 | 0.687 | 0.104 | 0.022 | 0.007 | 0.007 |

TOTAL 14.27 3.07 1.01 0.94 14.27 3.07 1.01 0.94 0.14 0.03 0.01 0.01

MODELED EMISSION RATES

| Device | Max Hourly Emission Rate (g/s) | | | | Daily Emission Rate (g/s) | | | | Annual Emission Rate (g/s) | | | | | | |
|---------------------|--------------------------------|----|------|-----|---------------------------|-------|------|-----|----------------------------|----|--------|-----|---------|--|---------|
| | NOx | CO | PM10 | SOx | NOx | CO | PM10 | SOx | NOx | CO | PM10 | SOx | | | |
| Boiler water pump | | | | | 0.48825 | 0.105 | | | | | 0.0014 | | 0.00111 | | 0.00008 |
| Emergency generator | | | | | 1.30949 | 0.282 | | | | | 0.0039 | | 0.00299 | | 0.00021 |

(a) Emergency generator HP based on 250 kw x 1.341 hp/kw

(b) Emergency standby equipment hours based on California ATCM for Stationary Diesel Engines (20 hr/yr for DPM greater than 0.4 g/bhp-hr)

(c) Emission factors are from AP-42 Table 3.3-1.

Blue Lake Generating Station Ultrapower 3 Cooling Tower Emissions

Assumptions:

101 is the ambient dry bulb temperature
77 is the ambient wet bulb temperature
7,700 gallons per minute is the circulating water flow rate
11,500 TDS concentration of the water (Default Value per AP-42 Section 13.4)
2,300 gallons per minute is the evaporation rate
0.001% is the percent drift loss (high efficiency drift eliminator)
1 is the particle size multiplier, k, for PM₁₀ (AP-42 Section 13.4).
8.34 Density of water (lbs/gal)
24 hrs operation/day
365 days operation/yr

Emissions:

$$\text{PM}_{10} \text{ (lb/hr)} = 11,500 \times 10^{-6} (\text{PM}) \times 7,700 \text{ (gal/min)} \times 8.34 \text{ (lb/gal)} \times 0.001\% \text{ (gal/gal circ)} \times 60 \text{ (min/hr)}$$

$$\text{PM}_{10} \text{ Emissions} = 0.44 \text{ lbs /hr}$$

$$\text{PM}_{10} \text{ Emissions} = 10.63 \text{ lbs /day} \quad 0.0558 \text{ g/s}$$

$$\text{PM}_{10} \text{ Emissions} = 3,881.59 \text{ lbs/yr} \quad 0.0558 \text{ g/s}$$

$$\text{PM}_{10} \text{ Emissions} = 1.941 \text{ tons/yr}$$

APPENDIX B
Emission Calculations

Blue Lake Generating Station Ultrapower 3
Boiler - Wood Emissions

Rating 185 MMBTU/hr 12.847 ton/hr
Annual Operation 8760 hr/yr 112,542 ton/yr
Wood GHV: 7200 BTU/lb

| Pollutant | Emission Factor Source | CAS Number | OEHHA Listed Air Toxic | Uncontrolled Emission Factor (lb/MMBtu) | Element/ Oxide Conversion (b) | Uncontrolled Emission Factor lb/ton | Control Efficiency | Controlled Emission Factor lb/ton | Uncontrolled Emission Rate (lb/hr) | Controlled Emission Rate (lb/hr) | Controlled Emission Rate (lb/yr) | Controlled Emission Rate (tpy) |
|---|------------------------|------------|------------------------|---|-------------------------------|-------------------------------------|--------------------|-----------------------------------|------------------------------------|----------------------------------|----------------------------------|--------------------------------|
| CO | Permit | | | 1 | | 1.440E+01 | 0 | 1.440E+01 | 185.00 | 185.00 | 1,620,600 | 810.30 |
| NOx | Permit | | | 0.15 | | 2.160E+00 | 0 | 2.160E+00 | 27.75 | 27.75 | 243,090 | 121.55 |
| PM10 | AP-42 (a) | | | 2.00 | | 2.880E+01 | 98 | 5.760E-01 | 370.00 | 7.40 | 64,824 | 32.41 |
| SOx | AP-42 (a) | | | 0.025 | | 3.600E-01 | 0 | 3.600E-01 | 4.63 | 4.63 | 40,515 | 20.26 |
| Inorganic Compounds | | | | | | | | | | | | |
| Antimony | AP-42 (a) | 7440-36-0 | Yes | 7.90E-06 | 1 | 1.138E-04 | 98 | 2.275E-06 | 1.46E-03 | 2.92E-05 | 2.56E-01 | 1.28E-04 |
| Arsenic | AP-42 (a) | 7440-38-2 | Yes | 2.20E-05 | 1 | 3.168E-04 | 98 | 6.336E-06 | 4.07E-03 | 8.14E-05 | 7.13E-01 | 3.57E-04 |
| Barium | AP-42 (a) | 7440-39-3 | Yes | 1.70E-04 | 1 | 2.448E-03 | 98 | 4.896E-05 | 3.15E-02 | 6.29E-04 | 5.51E+00 | 2.76E-03 |
| Beryllium | AP-42 (a) | 7440-41-7 | Yes | 1.10E-06 | 1 | 1.584E-05 | 98 | 3.168E-07 | 2.04E-04 | 4.07E-06 | 3.57E-02 | 1.78E-05 |
| Cadmium | AP-42 (a) | 7440-43-9 | Yes | 4.10E-06 | 1 | 5.904E-05 | 98 | 1.181E-06 | 7.59E-04 | 1.52E-05 | 1.33E-01 | 6.64E-05 |
| Chlorine | AP-42 (a) | 7782-50-5 | Yes | 7.90E-04 | 1 | 1.138E-02 | 0 | 1.138E-02 | 1.46E-01 | 1.46E-01 | 1.28E+03 | 6.40E-01 |
| Chromium Total | AP-42 (a) | 7440-47-3 | Yes | 2.10E-05 | 1 | 3.024E-04 | 98 | 6.048E-06 | 3.89E-03 | 7.77E-05 | 6.81E-01 | 3.40E-04 |
| Chromium hexavalent | AP-42 (a) | 18540-29-9 | Yes | 3.50E-06 | 1 | 5.040E-05 | 98 | 1.008E-06 | 6.48E-04 | 1.30E-05 | 1.13E-01 | 5.67E-05 |
| Cobalt | AP-42 (a) | 7440-48-4 | Yes | 6.50E-06 | 1 | 9.360E-05 | 98 | 1.872E-06 | 1.20E-03 | 2.41E-05 | 2.11E-01 | 1.05E-04 |
| Copper | AP-42 (a) | 1317-38-0 | Yes | 4.90E-05 | 1 | 7.056E-04 | 98 | 1.411E-05 | 9.07E-03 | 1.81E-04 | 1.59E+00 | 7.94E-04 |
| Hydrogen chloride | AP-42 (a) | 7647-01-0 | Yes | 1.90E-02 | 1 | 2.736E-01 | 0 | 2.736E-01 | 3.52E+00 | 3.52E+00 | 30791 | 15.40 |
| Iron Oxide | AP-42 (a) | 1309-37-1 | No | 9.90E-04 | 1.43 | 2.039E-02 | 98 | 4.077E-04 | 2.62E-01 | 5.24E-03 | 4.59E+01 | 2.29E-02 |
| Lead | AP-42 (a) | 7439-92-1 | Yes | 4.80E-05 | 1 | 6.912E-04 | 98 | 1.382E-05 | 8.88E-03 | 1.78E-04 | 1.56E+00 | 7.78E-04 |
| Manganese | AP-42 (a) | 7439-96-5 | Yes | 1.60E-03 | 1 | 2.304E-02 | 98 | 4.608E-04 | 2.96E-01 | 5.92E-03 | 5.19E+01 | 2.59E-02 |
| Mercury | AP-42 (a) | 7439-97-6 | Yes | 3.50E-06 | 1 | 5.040E-05 | 0 | 5.040E-05 | 6.48E-04 | 6.48E-04 | 5.67E+00 | 2.84E-03 |
| Molybdenum Trioxide (MoO ₃) | AP-42 (a) | 1313-27-5 | Yes | 2.10E-06 | 1.30 | 3.931E-05 | 98 | 7.862E-07 | 5.05E-04 | 1.01E-05 | 8.85E-02 | 4.42E-05 |
| Nickel | AP-42 (a) | 7440-02-0 | Yes | 3.30E-05 | 1 | 4.752E-04 | 98 | 9.504E-06 | 6.11E-03 | 1.22E-04 | 1.07E+00 | 5.35E-04 |
| Phosphorus | AP-42 (a) | 7723-14-0 | Yes | 2.70E-05 | 1 | 3.888E-04 | 98 | 7.776E-06 | 5.00E-03 | 9.99E-05 | 8.75E-01 | 4.38E-04 |
| Potassium | AP-42 (a) | No | | 3.90E-02 | 1 | 5.616E-01 | 98 | 1.123E-02 | 7.22E+00 | 1.44E-01 | 1.26E+03 | 6.32E-01 |
| Selenium | AP-42 (a) | 7782-49-2 | Yes | 2.80E-06 | 1 | 4.032E-05 | 0 | 4.032E-05 | 5.18E-04 | 5.18E-04 | 4.54E+00 | 2.27E-03 |
| Silver | AP-42 (a) | 7440-22-4 | Yes | 1.70E-03 | 1 | 2.448E-02 | 0 | 2.448E-02 | 3.15E-01 | 3.15E-01 | 2755 | 1.38 |
| Sodium | AP-42 (a) | No | | 3.60E-04 | 1 | 5.184E-03 | 98 | 1.037E-04 | 6.66E-02 | 1.33E-03 | 1.17E+01 | 5.83E-03 |
| Strontium | AP-42 (a) | 1314-11-0 | No | 1.00E-05 | 1 | 1.440E-04 | 98 | 2.880E-06 | 1.85E-03 | 3.70E-05 | 3.24E-01 | 1.62E-04 |
| Tin | AP-42 (a) | 18282-10-5 | No | 2.30E-05 | 1 | 3.312E-04 | 98 | 6.624E-06 | 4.26E-03 | 8.51E-05 | 7.45E-01 | 3.73E-04 |
| Titanium | AP-42 (a) | 13463-67-7 | No | 2.00E-05 | 1 | 2.880E-04 | 98 | 5.760E-06 | 3.70E-03 | 7.40E-05 | 6.48E-01 | 3.24E-04 |
| Vanadium | AP-42 (a) | 7440-62-2 | Yes | 9.80E-07 | 1 | 1.411E-05 | 98 | 2.822E-07 | 1.81E-04 | 3.63E-06 | 3.18E-02 | 1.59E-05 |
| Yttrium | AP-42 (a) | 1314-36-9 | No | 3.00E-07 | 1 | 4.320E-06 | 98 | 8.640E-08 | 5.55E-05 | 1.11E-06 | 9.72E-03 | 4.86E-06 |
| Zinc | AP-42 (a) | 7440-66-6 | Yes | 4.20E-04 | 1 | 6.048E-03 | 98 | 1.210E-04 | 7.77E-02 | 1.55E-03 | 1.36E+01 | 6.81E-03 |
| Organic Compounds | | | | | | | | | | | | |
| 2-Methylnaphthalene | CATEF (b) | 91-57-6 | No | 2.28E-08 | | 3.290E-07 | 0 | 3.290E-07 | 4.23E-06 | 4.23E-06 | 3.70E-02 | 1.85E-05 |
| Acenaphthene | CATEF (b) | 83-32-9 | Yes | 2.58E-08 | | 3.720E-07 | 0 | 3.720E-07 | 4.78E-06 | 4.78E-06 | 4.19E-02 | 2.09E-05 |
| Acenaphthylene | CATEF (b) | 208-96-8 | Yes | 1.51E-08 | | 2.170E-07 | 0 | 2.170E-07 | 2.79E-06 | 2.79E-06 | 2.44E-02 | 1.22E-05 |
| Acetaldehyde | CATEF (b) | 75-07-0 | Yes | 7.15E-05 | | 1.030E-03 | 0 | 1.030E-03 | 1.32E-02 | 1.32E-02 | 1.16E+02 | 5.80E-02 |
| Acrolein | CATEF (b) | 107-02-8 | Yes | 3.63E-06 | | 5.230E-05 | 0 | 5.230E-05 | 6.72E-04 | 6.72E-04 | 5.89E+00 | 2.94E-03 |
| Anthracene | CATEF (b) | 120-12-7 | Yes | 2.13E-08 | | 3.070E-07 | 0 | 3.070E-07 | 3.94E-06 | 3.94E-06 | 3.46E-02 | 1.73E-05 |
| Benzene | CATEF (b) | 71-43-2 | Yes | 1.03E-05 | | 1.490E-04 | 0 | 1.490E-04 | 1.91E-03 | 1.91E-03 | 1.68E+01 | 8.38E-03 |
| Benzo(a)anthracene | CATEF (b) | 56-55-6 | No | 7.64E-10 | | 1.100E-08 | 0 | 1.100E-08 | 1.41E-07 | 1.41E-07 | 1.24E-03 | 6.19E-07 |
| Benzo(a)pyrene | CATEF (b) | 50-32-8 | Yes | 7.64E-10 | | 1.100E-08 | 0 | 1.100E-08 | 1.41E-07 | 1.41E-07 | 1.24E-03 | 6.19E-07 |
| Benzo(b)fluoranthene | CATEF (b) | 205-99-2 | Yes | 1.46E-09 | | 2.100E-08 | 0 | 2.100E-08 | 2.70E-07 | 2.70E-07 | 2.36E-03 | 1.18E-06 |
| Benzo(e)pyrene | CATEF (b) | 192-97-2 | Yes | 2.84E-09 | | 4.090E-08 | 0 | 4.090E-08 | 5.25E-07 | 5.25E-07 | 4.60E-03 | 2.30E-06 |
| Benzo(g,h,i)perylene | CATEF (b) | 191-24-2 | Yes | 9.10E-10 | | 1.310E-08 | 0 | 1.310E-08 | 1.68E-07 | 1.68E-07 | 1.47E-03 | 7.37E-07 |
| Benzo(k)fluoranthene | CATEF (b) | 207-08-9 | Yes | 7.64E-10 | | 1.100E-08 | 0 | 1.100E-08 | 1.41E-07 | 1.41E-07 | 1.24E-03 | 6.19E-07 |
| Chrysene | CATEF (b) | 218-01-9 | Yes | 5.63E-09 | | 8.100E-08 | 0 | 8.100E-08 | 1.04E-06 | 1.04E-06 | 9.12E-03 | 4.56E-06 |
| Dibenzo(a,h)anthracene | CATEF (b) | 53-70-3 | No | 7.64E-10 | | 1.100E-08 | 0 | 1.100E-08 | 1.41E-07 | 1.41E-07 | 1.24E-03 | 6.19E-07 |
| Dioxin/4D 2378 | CATEF (b) | 1746-01-6 | Yes | 4.69E-13 | | 6.760E-12 | 0 | 6.760E-12 | 8.68E-11 | 8.68E-11 | 7.61E-07 | 3.80E-10 |

Blue Lake Generating Station Ultrapower 3
Boiler - Wood Emissions

| Pollutant | Emission Factor Source | CAS Number | OEHHA Listed Air Toxic | Uncontrolled Emission Factor (lb/MMBtu) | Element/Oxide Conversion (b) | Uncontrolled Emission Factor lb/ton | Control Efficiency | Controlled Emission Factor lb/ton | Uncontrolled Emission Rate (lb/hr) | Controlled Emission Rate (lb/hr) | Controlled Emission Rate (lb/yr) | Controlled Emission Rate (tpy) |
|--------------------------------|------------------------|------------|------------------------|---|------------------------------|-------------------------------------|--------------------|-----------------------------------|------------------------------------|----------------------------------|----------------------------------|--------------------------------|
| Dioxin:4D Total | CATEF (b) | 41903-57-5 | Yes | 8.13E-11 | | 1.170E-09 | 0 | 1.170E-09 | 1.50E-08 | 1.50E-08 | 1.32E-04 | 6.58E-08 |
| Dioxin:5D 12378 | CATEF (b) | 40321-76-4 | Yes | 1.09E-12 | | 1.570E-11 | 0 | 1.570E-11 | 2.02E-10 | 2.02E-10 | 1.77E-06 | 8.83E-10 |
| Dioxin:5D Total | CATEF (b) | 36088-22-9 | Yes | 6.90E-11 | | 9.940E-10 | 0 | 9.940E-10 | 1.28E-08 | 1.28E-08 | 1.12E-04 | 5.59E-08 |
| Dioxin:6D 123478 | CATEF (b) | 39227-28-6 | Yes | 1.78E-12 | | 2.560E-11 | 0 | 2.560E-11 | 3.29E-10 | 3.29E-10 | 2.88E-06 | 1.44E-09 |
| Dioxin:6D 123678 | CATEF (b) | 57653-85-7 | Yes | 2.60E-12 | | 3.740E-11 | 0 | 3.740E-11 | 4.80E-10 | 4.80E-10 | 4.21E-06 | 2.10E-09 |
| Dioxin:6D 123789 | CATEF (b) | 19408-74-3 | Yes | 1.83E-12 | | 2.640E-11 | 0 | 2.640E-11 | 3.39E-10 | 3.39E-10 | 2.97E-06 | 1.49E-09 |
| Dioxin:6D Total | CATEF (b) | 34465-46-8 | Yes | 1.89E-10 | | 2.720E-09 | 0 | 2.720E-09 | 3.49E-08 | 3.49E-08 | 3.06E-04 | 1.53E-07 |
| Dioxin:7D 1234678 | CATEF (b) | 35822-46-9 | Yes | 3.99E-11 | | 5.740E-10 | 0 | 5.740E-10 | 7.37E-09 | 7.37E-09 | 6.46E-05 | 3.23E-08 |
| Dioxin:7D Total | CATEF (b) | 37871-00-4 | Yes | 7.50E-11 | | 1.080E-09 | 0 | 1.080E-09 | 1.39E-08 | 1.39E-08 | 1.22E-04 | 6.08E-08 |
| Dioxin:8D | CATEF (b) | 3268-87-9 | Yes | 5.46E-10 | | 7.860E-09 | 0 | 7.860E-09 | 1.01E-07 | 1.01E-07 | 8.85E-04 | 4.42E-07 |
| Fluoranthene | CATEF (b) | 206-44-0 | Yes | 6.85E-08 | | 9.860E-07 | 0 | 9.860E-07 | 1.27E-05 | 1.27E-05 | 1.11E-01 | 5.55E-05 |
| Fluorene | CATEF (b) | 86-73-7 | Yes | 4.72E-08 | | 6.790E-07 | 0 | 6.790E-07 | 8.72E-06 | 8.72E-06 | 7.64E-02 | 3.82E-05 |
| Formaldehyde | CATEF (b) | 50-00-0 | Yes | 4.54E-05 | | 6.540E-04 | 0 | 6.540E-04 | 8.40E-03 | 8.40E-03 | 7.36E+01 | 3.68E-02 |
| Furan:4F 2378 | CATEF (b) | 51207-31-9 | Yes | 2.60E-12 | | 3.740E-11 | 0 | 3.740E-11 | 4.80E-10 | 4.80E-10 | 4.21E-06 | 2.10E-09 |
| Furan:4F Total | CATEF (b) | 55722-27-5 | Yes | 6.77E-11 | | 9.750E-10 | 0 | 9.750E-10 | 1.25E-08 | 1.25E-08 | 1.10E-04 | 5.49E-08 |
| Furan:5F 12378 | CATEF (b) | 57114-41-6 | Yes | 1.56E-12 | | 2.240E-11 | 0 | 2.240E-11 | 2.88E-10 | 2.88E-10 | 2.52E-06 | 1.26E-09 |
| Furan:5F 23478 | CATEF (b) | 5711-31-4 | Yes | 1.78E-12 | | 2.570E-11 | 0 | 2.570E-11 | 3.30E-10 | 3.30E-10 | 2.89E-06 | 1.45E-09 |
| Furan:5F Total | CATEF (b) | 30402-15-4 | Yes | 2.56E-11 | | 3.690E-10 | 0 | 3.690E-10 | 4.74E-09 | 4.74E-09 | 4.15E-05 | 2.08E-08 |
| Furan:6F 123478 | CATEF (b) | 70648-26-9 | Yes | 1.86E-12 | | 2.680E-11 | 0 | 2.680E-11 | 3.44E-10 | 3.44E-10 | 3.02E-06 | 1.51E-09 |
| Furan:6F 123678 | CATEF (b) | 57117-44-9 | Yes | 1.89E-12 | | 2.720E-11 | 0 | 2.720E-11 | 3.49E-10 | 3.49E-10 | 3.06E-06 | 1.53E-09 |
| Furan:6F 123789 | CATEF (b) | 72918-21-9 | Yes | 5.78E-13 | | 8.320E-12 | 0 | 8.320E-12 | 1.07E-10 | 1.07E-10 | 9.36E-07 | 4.68E-10 |
| Furan:6F 234678 | CATEF (b) | 60851-34-5 | Yes | 2.18E-12 | | 3.140E-11 | 0 | 3.140E-11 | 4.03E-10 | 4.03E-10 | 3.53E-06 | 1.77E-09 |
| Furan:6F Total | CATEF (b) | 55684-94-1 | Yes | 1.85E-11 | | 2.670E-10 | 0 | 2.670E-10 | 3.43E-09 | 3.43E-09 | 3.00E-05 | 1.50E-08 |
| Furan:7F 1234678 | CATEF (b) | 67562-39-4 | Yes | 1.38E-11 | | 1.980E-10 | 0 | 1.980E-10 | 2.54E-09 | 2.54E-09 | 2.23E-05 | 1.11E-08 |
| Furan:7F 1234789 | CATEF (b) | 55673-89-7 | Yes | 1.13E-12 | | 1.630E-11 | 0 | 1.630E-11 | 2.09E-10 | 2.09E-10 | 1.83E-06 | 9.17E-10 |
| Furan:7F Total | CATEF (b) | 38998-75-3 | Yes | 2.60E-11 | | 3.750E-10 | 0 | 3.750E-10 | 4.82E-09 | 4.82E-09 | 4.22E-05 | 2.11E-08 |
| Furan:8F | CATEF (b) | 39001-02-0 | Yes | 3.42E-11 | | 4.920E-10 | 0 | 4.920E-10 | 6.32E-09 | 6.32E-09 | 5.54E-05 | 2.77E-08 |
| Indeno(1,2,3-c,d)pyrene | CATEF (b) | 193-20-3 | Yes | 1.58E-09 | | 2.280E-08 | 0 | 2.280E-08 | 2.93E-07 | 2.93E-07 | 2.57E-03 | 1.28E-06 |
| Naphthalene | CATEF (b) | 91-20-3 | Yes | 1.58E-06 | | 2.280E-05 | 0 | 2.280E-05 | 2.93E-04 | 2.93E-04 | 2.57E+00 | 1.28E-03 |
| PCB:Decachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 2.24E-11 | | 3.230E-10 | 0 | 3.230E-10 | 4.15E-09 | 4.15E-09 | 3.64E-05 | 1.82E-08 |
| PCB:Dichlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 6.09E-10 | | 8.770E-09 | 0 | 8.770E-09 | 1.13E-07 | 1.13E-07 | 9.87E-04 | 4.93E-07 |
| PCB:Heptachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 8.82E-11 | | 1.270E-09 | 0 | 1.270E-09 | 1.63E-08 | 1.63E-08 | 1.43E-04 | 7.15E-08 |
| PCB:Hexachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 3.57E-10 | | 5.140E-09 | 0 | 5.140E-09 | 6.60E-08 | 6.60E-08 | 5.78E-04 | 2.89E-07 |
| PCB:Monochlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 2.70E-10 | | 3.890E-09 | 0 | 3.890E-09 | 5.00E-08 | 5.00E-08 | 4.38E-04 | 2.19E-07 |
| PCB:Nonachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 7.22E-12 | | 1.040E-10 | 0 | 1.040E-10 | 1.34E-09 | 1.34E-09 | 1.17E-05 | 5.85E-09 |
| PCB:Octachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 1.22E-11 | | 1.750E-10 | 0 | 1.750E-10 | 2.25E-09 | 2.25E-09 | 1.97E-05 | 9.85E-09 |
| PCB:Pentachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 7.99E-10 | | 1.150E-08 | 0 | 1.150E-08 | 1.48E-07 | 1.48E-07 | 1.29E-03 | 6.47E-07 |
| PCB:Tetrachlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 1.98E-09 | | 2.850E-08 | 0 | 2.850E-08 | 3.66E-07 | 3.66E-07 | 3.21E-03 | 1.60E-06 |
| PCB:Trichlorinated biphenyls | CATEF (b) | 1336-36-3 | See Subtotal | 2.19E-09 | | 3.160E-08 | 0 | 3.160E-08 | 4.06E-07 | 4.06E-07 | 3.56E-03 | 1.78E-06 |
| Subtotal PCB's | CATEF (b) | 1336-36-3 | Yes | 6.34E-09 | | 9.13E-08 | 0 | 9.127E-08 | 1.17E-06 | 1.17E-06 | 1.03E-02 | 5.14E-06 |
| Perylene | CATEF (b) | 198-55-0 | Yes | 7.64E-10 | | 1.100E-08 | 0 | 1.100E-08 | 1.41E-07 | 1.41E-07 | 1.24E-03 | 6.19E-07 |
| Phenanthrene | CATEF (b) | 85-01-8 | Yes | 1.44E-07 | | 2.080E-06 | 0 | 2.080E-06 | 2.67E-05 | 2.67E-05 | 2.34E-01 | 1.17E-04 |
| Pyrene | CATEF (b) | 129-00-0 | Yes | 3.81E-08 | | 5.480E-07 | 0 | 5.480E-07 | 7.04E-06 | 7.04E-06 | 6.17E-02 | 3.08E-05 |
| Toluene | CATEF (b) | 108-88-3 | Yes | 1.18E-05 | | 1.700E-04 | 0 | 1.700E-04 | 2.18E-03 | 2.18E-03 | 1.91E-01 | 9.57E-03 |
| Vinyl Chloride | CATEF (b) | 75-01-4 | Yes | 1.09E-05 | | 1.570E-04 | 0 | 1.570E-04 | 2.02E-03 | 2.02E-03 | 1.77E+01 | 8.83E-03 |
| Xylene | CATEF (b) | 1330-20-7 | Yes | 1.11E-05 | | 1.600E-04 | 0 | 1.600E-04 | 2.06E-03 | 2.06E-03 | 1.80E+01 | 9.00E-03 |

(a) Emission factors for inorganic air toxics are from AP-42 Section 1.6.

(b) Emission factors for organic air toxics are from CARB's CATEF database, Source Classification Code 10100903.

Modeled Emission Rate

CO

NOx

PM10

Max Hour (g/s)

23.31

3.4965

3.4965

0.9324

0.9324

Blue Lake Generating Station Ultrapower 3
Boiler - Propane Combustion

| | | | | | |
|-------------|--------------------|------------------------|-----------------------|--|--|
| Rating | 80 (MMBTU/hr) | | | | |
| Propane GHV | 90000 (BTU/gal) | | | | |
| Propane Use | 888.89 (gal/hr) | 0.88889 (1000 gal/hr) | Based on Rating | | |
| Propane Use | 21,333 (gal/day) | 21.333 (1000 gal/day) | Based on Rating | | |
| Propane Use | 1,780,000 (gal/yr) | 1,780.00 (1000 gal/yr) | Based on Permit Limit | | |

| Pollutant | | Emission Factor (lb/1000 gal) (a) | Emission (lb/hr) | Emission (lb/day) | Emission (lb/yr) | Emission (tpy) |
|------------------|--|--------------------------------------|---------------------|----------------------|---------------------|-------------------|
| CO | | 3.2 | 2.8444 | 68.267 | 5696.0 | 2.85 |
| NOx | | 19 | 16.8889 | 405.333 | 33820.0 | 16.91 |
| PM ₁₀ | | 0.6 | 0.5333 | 12.800 | 1068.0 | 0.53 |
| SOx | | 0.018 | 0.0160 | 0.384 | 32.0 | 0.02 |

| | Emission Factor Natural Gas (lb/MMCF) (b) | Emission Factor Propane (lb/1000 gal) | Emission (lb/hr) | Emission (lb/day) | Emission (lb/yr) | Emission (tpy) |
|----------------|---|---|---------------------|----------------------|---------------------|-------------------|
| Benzene | 0.0058 | 0.000522 | 4.640E-04 | 1.114E-02 | 0.929 | 0.000465 |
| Formaldehyde | 0.0123 | 0.001107 | 9.840E-04 | 2.362E-02 | 1.970 | 0.000985 |
| Benzo(a)pyrene | 0.0001 | 0.000009 | 8.000E-06 | 1.920E-04 | 0.016 | 0.000008 |
| Naphthalene | 0.0003 | 0.000027 | 2.400E-05 | 5.760E-04 | 0.048 | 0.000024 |
| Acetaldehyde | 0.0031 | 0.000279 | 2.480E-04 | 5.952E-03 | 0.497 | 0.000248 |
| Acrolein | 0.0027 | 0.000243 | 2.160E-04 | 5.184E-03 | 0.433 | 0.000216 |
| Propylene | 0.5300 | 0.047700 | 4.240E-02 | 1.018E+00 | 84.906 | 0.042453 |
| Toluene | 0.0265 | 0.002385 | 2.120E-03 | 5.088E-02 | 4.245 | 0.002123 |
| Xylenes | 0.0197 | 0.001773 | 1.576E-03 | 3.782E-02 | 3.156 | 0.001578 |
| Ethyl Benzene | 0.0069 | 0.000621 | 5.520E-04 | 1.325E-02 | 1.105 | 0.000553 |
| Hexane | 0.0046 | 0.000414 | 3.680E-04 | 8.832E-03 | 0.737 | 0.000368 |

References

- (a) AP-42 Section 1.6
- (b) Ventura County Emission Factors for Natural Gas (10 - 100 MMBTU/hr), converted based on 1000 BTU/cf natural gas and 90,000 BTU/gal Propane

| Modeled Emission Rate (Propane) | Max Hour (g/s) | Max Day (g/s) | Annual (g/s) |
|---------------------------------|----------------|---------------|--------------|
| CO | 0.3584 | | |
| NOx | 2.128 | | 0.486452 |
| PM10 | | 0.0672 | 0.015362 |
| Modeled Emission Rate (Wood) | Max Hour (g/s) | Max Day (g/s) | Annual (g/s) |
| CO | 23.31 | | |
| NOx | 3.4965 | | 3.496500 |
| PM10 | | 0.9324 | 0.932400 |
| Modeled Emission Rate (Total) | Max Hour (g/s) | Max Day (g/s) | Annual (g/s) |
| CO | 23.6684 | | |
| NOx | 5.6245 | | 3.9830 |
| PM10 | | 0.9996 | 0.9478 |

Blue Lake Generating Station Ultrapower 3 Diesel Engines

| Device | Rating (a) | Operation | |
|---------------------|------------|-----------|-------------|
| | (hp) | (hr/day) | (hr/yr) (b) |
| Boiler Water Pump | 125 | 0.5 | 20 |
| Emergency Generator | 335.25 | 0.5 | 20 |

| Device | Emission Factor (lb/hp/hr) (c) | | | | Emission Rate (lb/hr) | | | | Emission Rate (lb/day) | | | | Emission Rate (tons/year) | | | |
|---------------------|--------------------------------|---------|--------|---------|-----------------------|-------|-------|-------|------------------------|-------|-------|-------|---------------------------|-------|-------|-------|
| | NOx | CO | PM10 | SOx | NOx | CO | PM10 | SOx | NOx | CO | PM10 | SOx | NOx | CO | PM10 | SOx |
| Boiler water pump | 0.031 | 0.00668 | 0.0022 | 0.00205 | 1.938 | 0.418 | 0.138 | 0.128 | 1.938 | 0.418 | 0.138 | 0.128 | 0.039 | 0.008 | 0.003 | 0.003 |
| Emergency generator | 0.031 | 0.00668 | 0.0022 | 0.00205 | 5.196 | 1.120 | 0.369 | 0.344 | 5.196 | 1.120 | 0.369 | 0.344 | 0.104 | 0.022 | 0.007 | 0.007 |

TOTAL 7.13 1.54 0.51 0.47 7.13 1.54 0.51 0.47 0.143 0.031 0.010 0.009

MODELED EMISSION RATES

| Device | Max Hourly Emission Rate (g/s) | | | | Daily Emission Rate (g/s) | | | | Annual Emission Rate (g/s) | | | |
|---------------------|--------------------------------|--|--------|--------|---------------------------|--|--|--------|----------------------------|--------|--|--------|
| | 1-Hour | | 8-Hour | | | | | | | | | |
| | | | NOx | CO | CO | | | PM10 | | NOx | | PM10 |
| Boiler water pump | | | 0.2441 | 0.0526 | 0.0066 | | | 0.0007 | | 0.0011 | | 0.0001 |
| Emergency generator | | | 0.6547 | 0.1411 | 0.0176 | | | 0.0019 | | 0.0030 | | 0.0002 |

(a) Emergency generator HP based on 250 kw x 1.341 hp/kw

(b) Emergency standby equipment hours based on California ATCM for Stationary Diesel Engines (20 hr/yr for DPM greater than 0.4 g/bhp-hr)

(c) Emission factors are from AP-42 Table 3.3-1.

Blue Lake Generating Station Ultrapower 3 Cooling Tower Emissions

Assumptions:

101 is the ambient dry bulb temperature
77 is the ambient wet bulb temperature
7,700 gallons per minute is the circulating water flow rate
11,500 TDS concentration of the water (Default Value per AP-42 Section 13.4)
2,300 gallons per minute is the evaporation rate
0.001% is the percent drift loss (high efficiency drift eliminator)
1 is the particle size multiplier, k, for PM₁₀ (AP-42 Section 13.4).
8.34 Density of water (lbs/gal)
24 hrs operation/day
365 days operation/yr

Emissions:

$$PM_{10} (\text{lb/hr}) = 11,500 \times 10^{\circ} (\text{PM}) \times 7,700 (\text{gal/min}) \times 8.34 (\text{lb/gal}) \times 0.001\% (\text{gal/gal circ}) \times 60 (\text{min/hr})$$

$$PM_{10} \text{ Emissions} = 0.44 \text{ lbs /hr}$$

$$PM_{10} \text{ Emissions} = 10.63 \text{ lbs /day} \quad 0.0558 \text{ g/s}$$

$$PM_{10} \text{ Emissions} = 3,881.59 \text{ lbs/yr} \quad 0.0558 \text{ g/s}$$

$$PM_{10} \text{ Emissions} = 1.941 \text{ tons/yr}$$

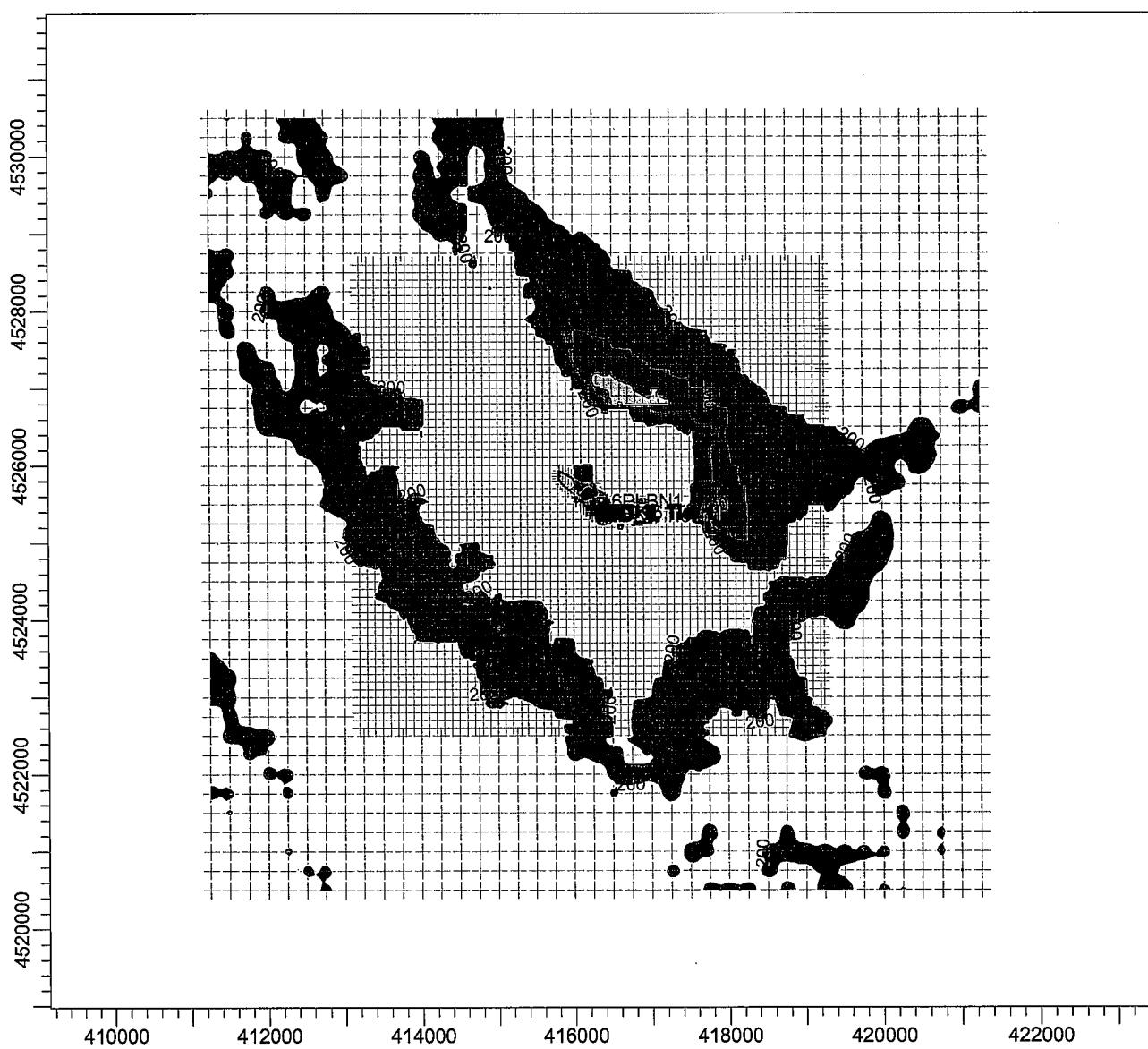
APPENDIX C
PSD and NAAQS Modeling

APPENDIX C.1
Modeling Input and Output Files

| File.isc | Scenario | Averaging Time | Pollutant | Met Year | Sources |
|----------|--|----------------|-----------|-----------|-----------------|
| BLNOSI00 | Significant Impact Area for Nox 2000 Annual | Annual | Nox | 2000 | Facility |
| BLNOSI01 | Significant Impact Area for Nox 2001 Annual | Annual | Nox | 2001 | Facility |
| BLNOSI02 | Significant Impact Area for Nox 2002 Annual | Annual | Nox | 2002 | Facility |
| BLNOSI03 | Significant Impact Area for Nox 2003 Annual | Annual | Nox | 2003 | Facility |
| BLNOSI04 | Significant Impact Area for Nox 2004 Annual | Annual | Nox | 2004 | Facility |
| BLCOSI1H | Significant Impact Area for CO 2000 - 2004 1 Hour | 1 Hour | CO | 2000-2004 | Facility |
| BLCOSI8H | Significant Impact Area for CO 2000 - 2004 8 Hour | 8 Hour | CO | 2000-2004 | Facility |
| BLPMSI00 | Significant Impact Area for PM 2000 Annual | Annual | PM | 2000 | Facility |
| BLPMSI01 | Significant Impact Area for PM 2001 Annual | Annual | PM | 2001 | Facility |
| BLPMSI02 | Significant Impact Area for PM 2002 Annual | Annual | PM | 2002 | Facility |
| BLPMSI03 | Significant Impact Area for PM 2003 Annual | Annual | PM | 2003 | Facility |
| BLPMSI04 | Significant Impact Area for PM 2004 Annual | Annual | PM | 2004 | Facility |
| BLPMSI24 | Significant Impact Area for PM 2000 - 2004 24 Hour | 24 Hour | PM | 2000-2004 | Facility |
| BLNOAQ1H | CAAQS Compliance for Nox 2000 - 2004 1 Hour | 1 Hour | Nox | 2000-2004 | Facility |
| BLNOIN00 | PSD Increment for Nox 2000 Annual | Annual | Nox | 2000 | Facility+Nearby |
| BLNOIN01 | PSD Increment for Nox 2001 Annual | Annual | Nox | 2001 | Facility+Nearby |
| BLNOIN02 | PSD Increment for Nox 2002 Annual | Annual | Nox | 2002 | Facility+Nearby |
| BLNOIN03 | PSD Increment for Nox 2003 Annual | Annual | Nox | 2003 | Facility+Nearby |
| BLNOIN04 | PSD Increment for Nox 2004 Annual | Annual | Nox | 2004 | Facility+Nearby |
| BLPMIN00 | PSD Increment for PM 2000 Annual | Annual | PM | 2000 | Facility+Nearby |
| BLPMIN01 | PSD Increment for PM 2001 Annual | Annual | PM | 2001 | Facility+Nearby |
| BLPMIN02 | PSD Increment for PM 2002 Annual | Annual | PM | 2002 | Facility+Nearby |
| BLPMIN03 | PSD Increment for PM 2003 Annual | Annual | PM | 2003 | Facility+Nearby |
| BLPMIN04 | PSD Increment for PM 2004 Annual | Annual | PM | 2004 | Facility+Nearby |
| BLPMIN24 | PSD Increment for PM 2000 - 2004 24 Hour | 24 Hour | PM | 2000-2004 | Facility+Nearby |
| BLPM2400 | NAAQS Compliance for PM 24 Hour (4th High) | 24 Hour | PM | 2000 | Facility |
| BLPM2401 | NAAQS Compliance for PM 24 Hour (4th High) | 24 Hour | PM | 2001 | Facility |
| BLPM2402 | NAAQS Compliance for PM 24 Hour (4th High) | 24 Hour | PM | 2002 | Facility |
| BLPM2403 | NAAQS Compliance for PM 24 Hour (4th High) | 24 Hour | PM | 2003 | Facility |
| BLPM2404 | NAAQS Compliance for PM 24 Hour (4th High) | 24 Hour | PM | 2004 | Facility |

APPENDIX C.2
Modeling Figures

PROJECT TITLE:
1-Hour CO AAQS Maximum Impact, Meteorological Years 2000 - 04



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:
**Maximum Impact:
416600 E; 4526800 N**

SOURCES:

4

COMPANY NAME:

BlueScape Environmental

RECEPTORS:

4850

MODELER:

Gretchen Jüttner

OUTPUT TYPE:

CONC

SCALE:

1:87,735

0

3 km

MAX:

842.42194 ug/m³

DATE:

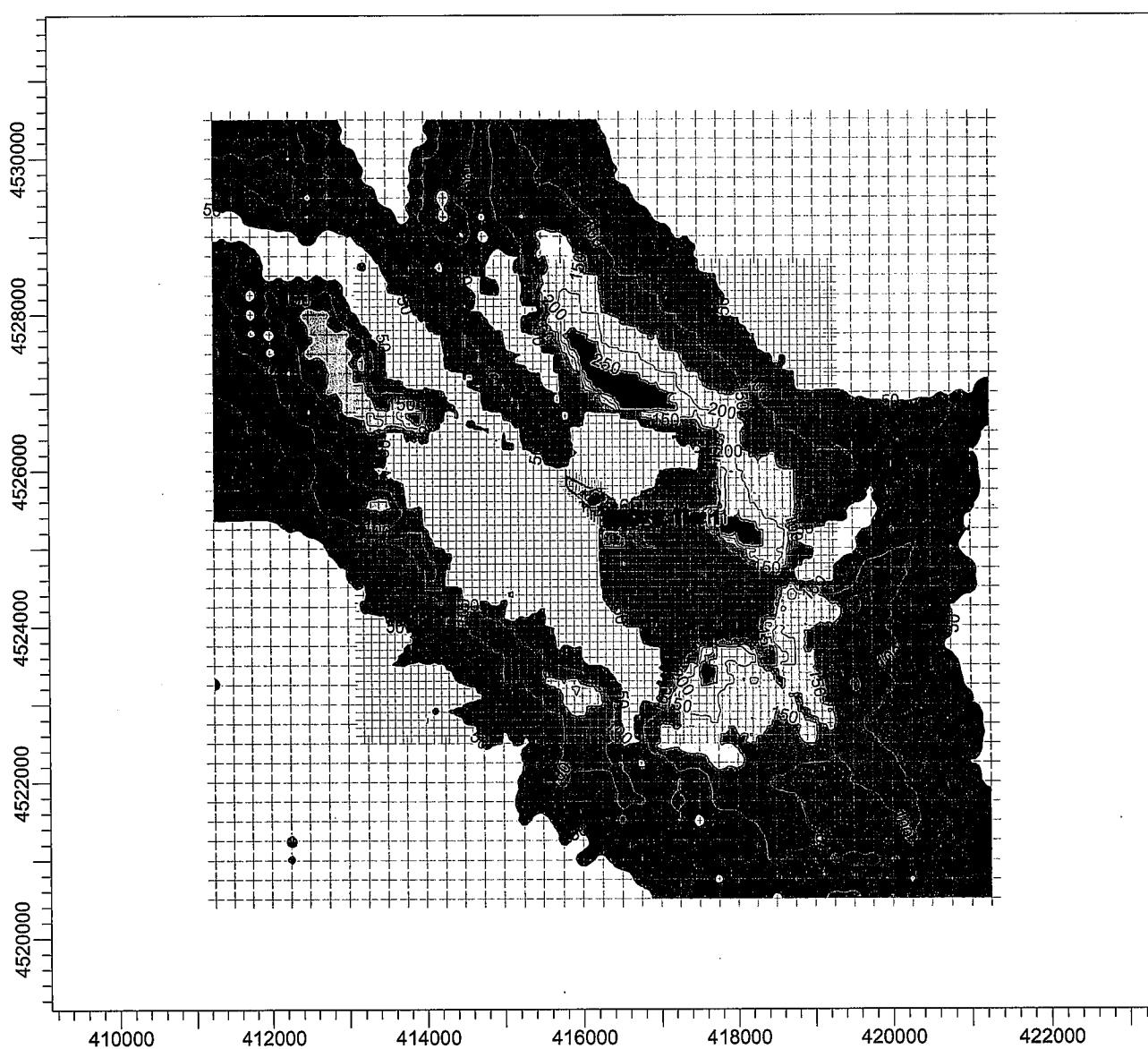
2/7/2006



**BLUESCAPE
ENVIRONMENTAL**

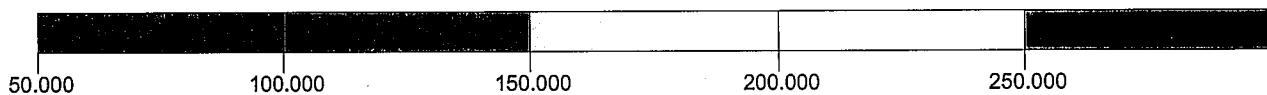
PROJECT NO.:

PROJECT TITLE:
8-Hour CO AAQS Maximum Impact, Meteorological Years 2000 - 04



PLOT FILE OF HIGH 1ST HIGH 8-HR VALUES FOR SOURCE GROUP: ALL

ug/m³

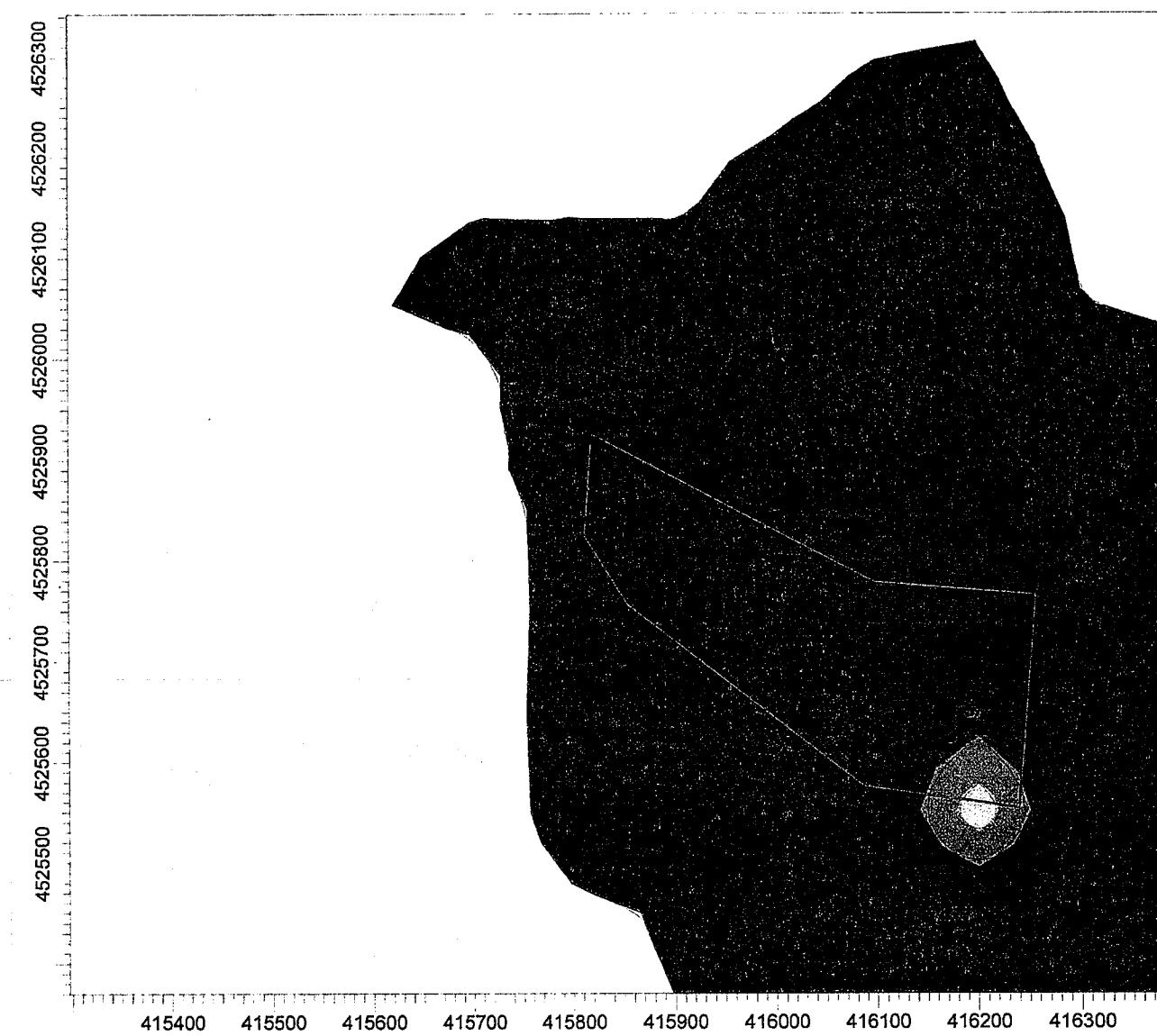


| | | |
|--|--|---|
| COMMENTS: Maximum Impact: 416500 E; 4526900 N SIA = NONE. | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 4850 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:86,923 0 3 km |
| | MAX: 386.93372 ug/m ³ | DATE: 2/7/2006 |
| | PROJECT NO.: | |



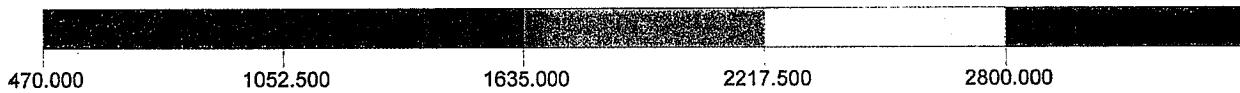
BLUESCAPE
ENVIRONMENTAL

PROJECT TITLE:
1-Hour NOx AAQS Maximum Impact, Meteorological Year 2000 - 04



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:
Maximum Impact:
416201.3 E; 4525558.5 N

SOURCES:

4

COMPANY NAME:

BlueScape Environmental

RECEPTORS:

9730

MODELER:

Gretchen Jüttner

OUTPUT TYPE:

CONC

SCALE:

1:6,632

0 0.2 km

MAX:

2798.34424 ug/m³

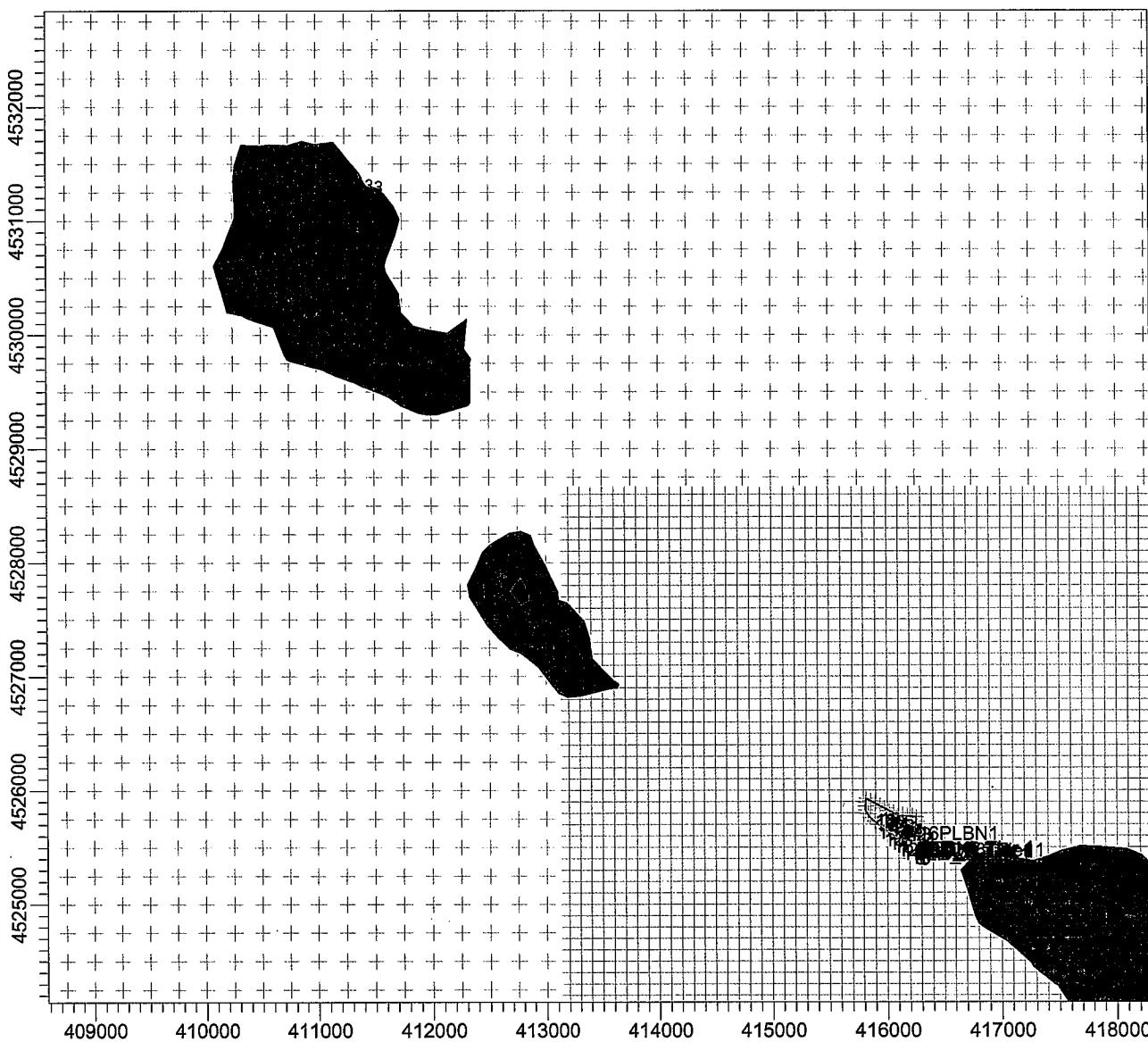
DATE:

2/7/2006

BLUE SCAPe



PROJECT TITLE:
Annual NOx AAQS Maximum Impact, Meteorological Year 2000



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³

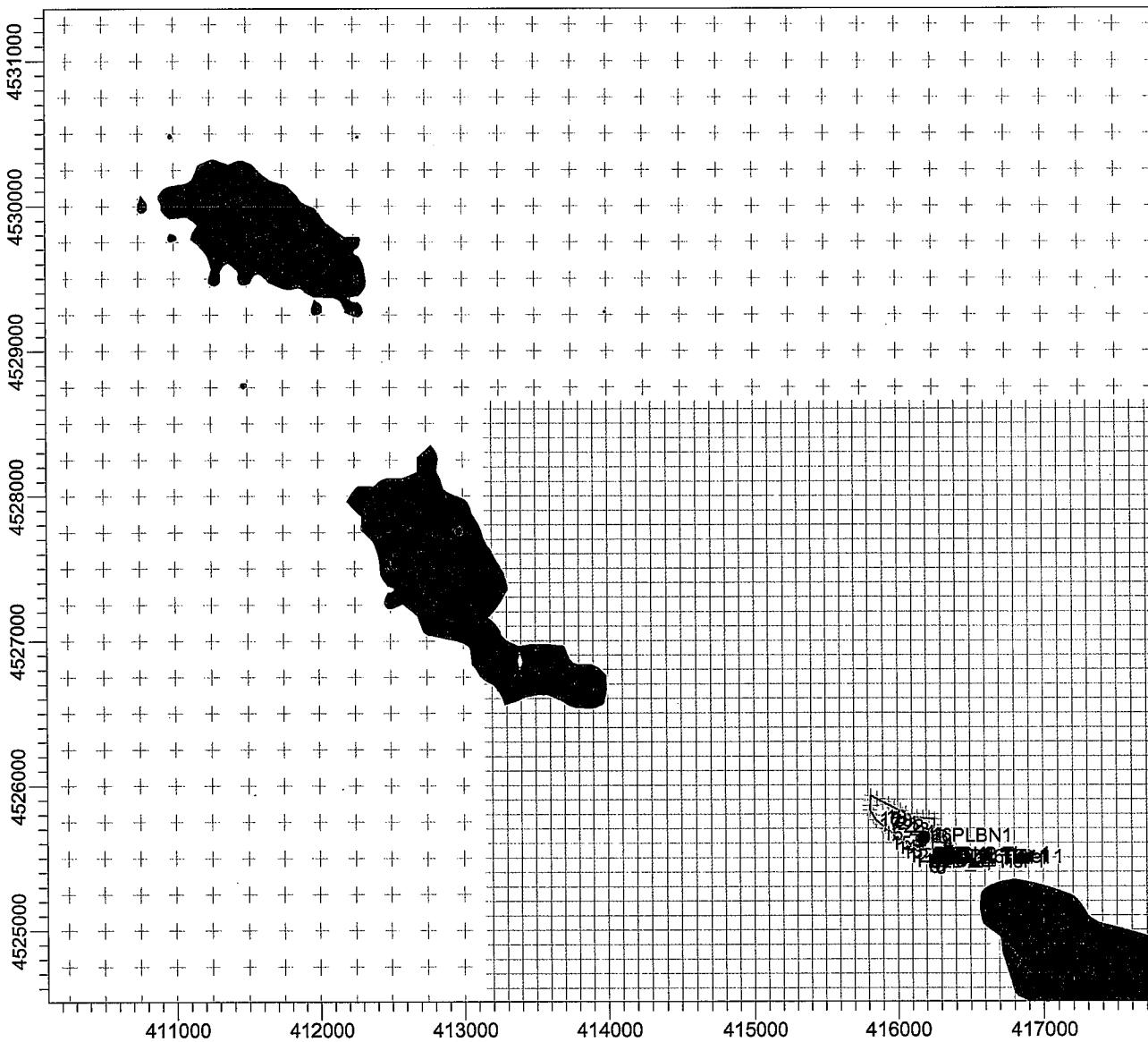


| | | |
|--|--|--|
| COMMENTS: Maximum Impact: 418400 E; 4524000 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 9730 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:59,326 0 2 km |
| | MAX: 4.528 ug/m ³ | DATE: 2/7/2006 |
| | PROJECT NO.: | |



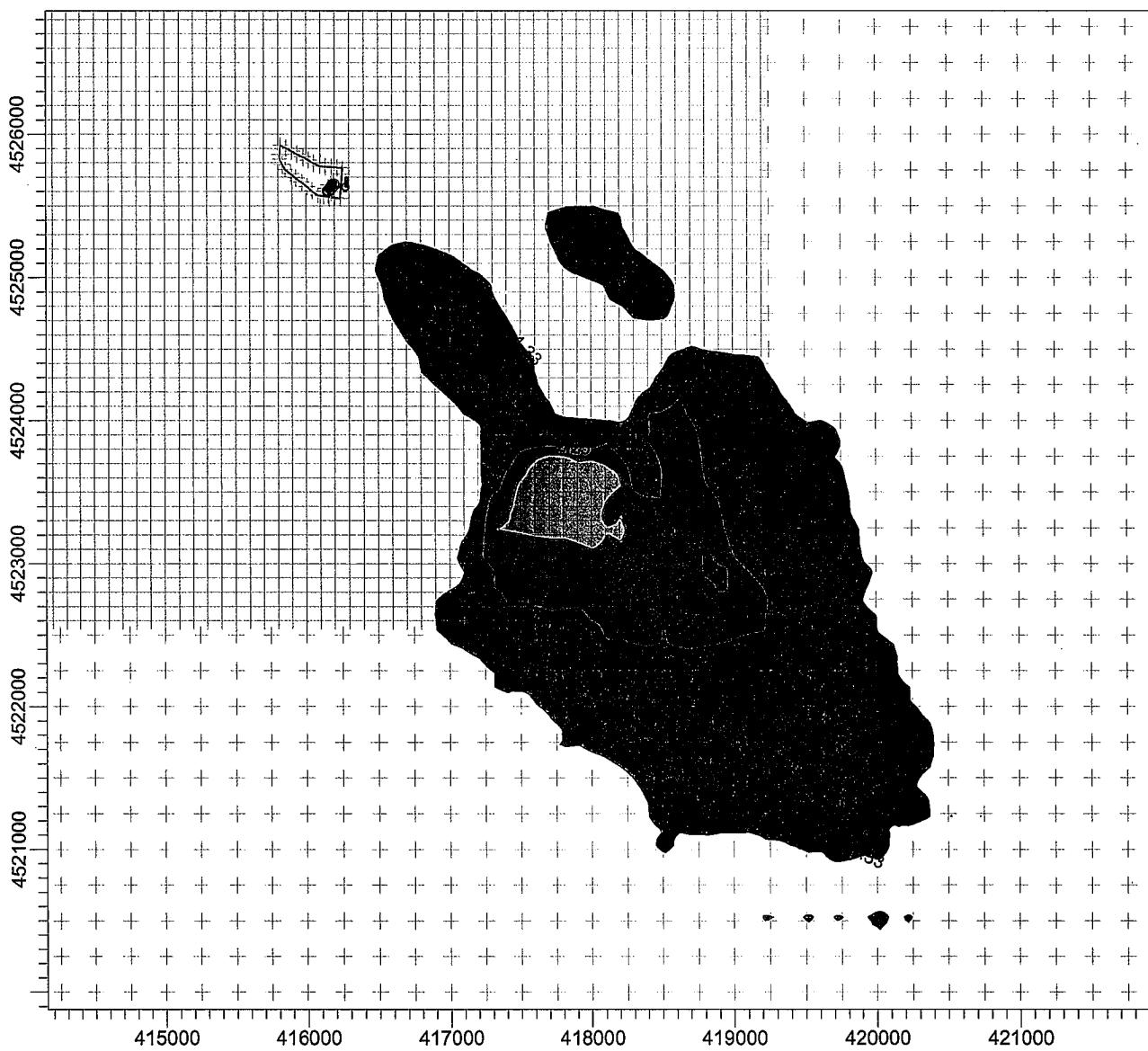
BLUESCAPE
ENVIRONMENTAL

PROJECT TITLE:
Annual NOx AAQS Maximum Impact, Meteorological Year 2001



| | | |
|--|--|---|
| COMMENTS: Maximum Impact: 417700 E; 4523700 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 9730 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:46,725 0  1 km |
| | MAX: 4.43653 ug/m ³ | DATE: 2/7/2006 |
| | PROJECT NO.: | |

PROJECT TITLE:
Annual NOx AAQS Maximum Impact, Meteorological Year 2002



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

Maximum Impact:
 417700 E; 4523700 N

SOURCES:

4

COMPANY NAME:

BlueScape Environmental

RECEPTORS:

9730

MODELER:

Gretchen Jüttner

OUTPUT TYPE:

CONC

SCALE:

1:47,609

0 1 km



BLUESCAPE
ENVIRONMENTAL

MAX:

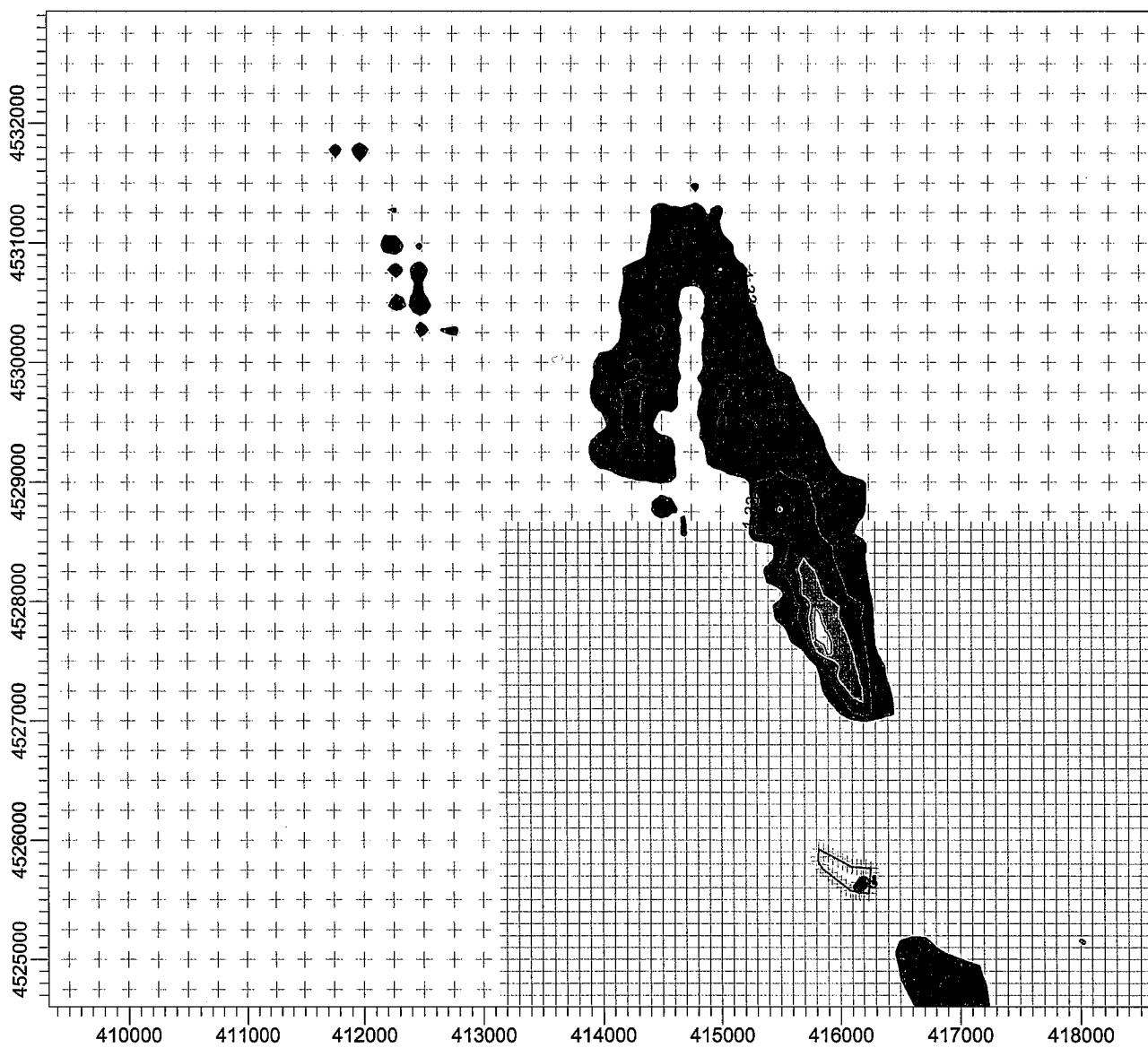
4.63336 ug/m³

DATE:

2/7/2006

PROJECT NO.:

PROJECT TITLE:
Annual NOx AAQS Maximum Impact, Meteorological Year 2003



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

$\mu\text{g}/\text{m}^3$



COMMENTS:

Maximum Impact:
 415900 E; 4527600 N

SOURCES:

4

COMPANY NAME:

BlueScape Environmental

RECEPTORS:

9730

MODELER:

Gretchen Jüttner

OUTPUT TYPE:

CONC

SCALE:

1:56,832

0

2 km



BLUESCAPE
ENVIRONMENTAL

MAX:

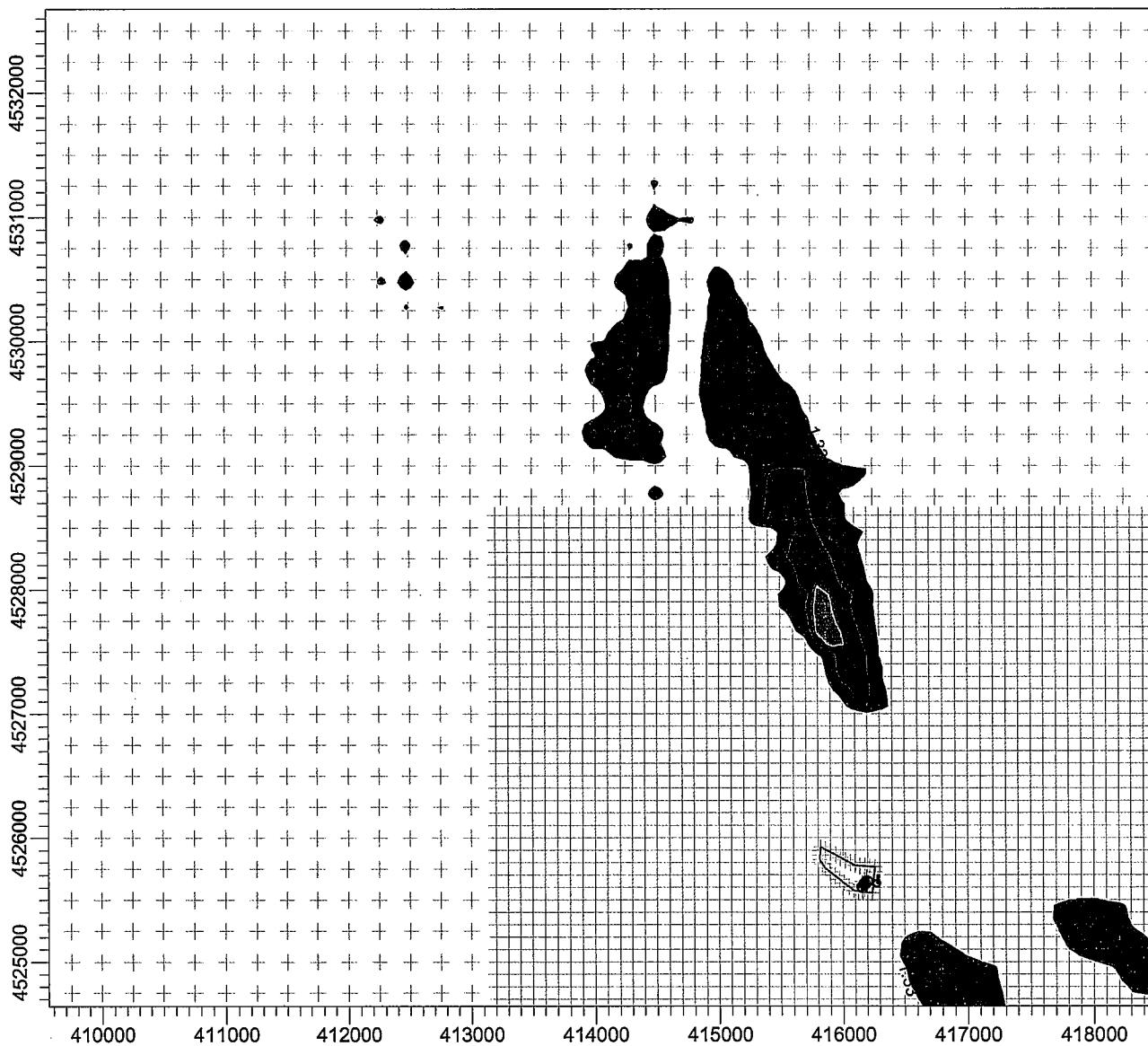
3.98038 $\mu\text{g}/\text{m}^3$

DATE:

2/7/2006

PROJECT NO.:

PROJECT TITLE:
Annual NOx AAQS Maximum Impact, Meteorological Year 2004



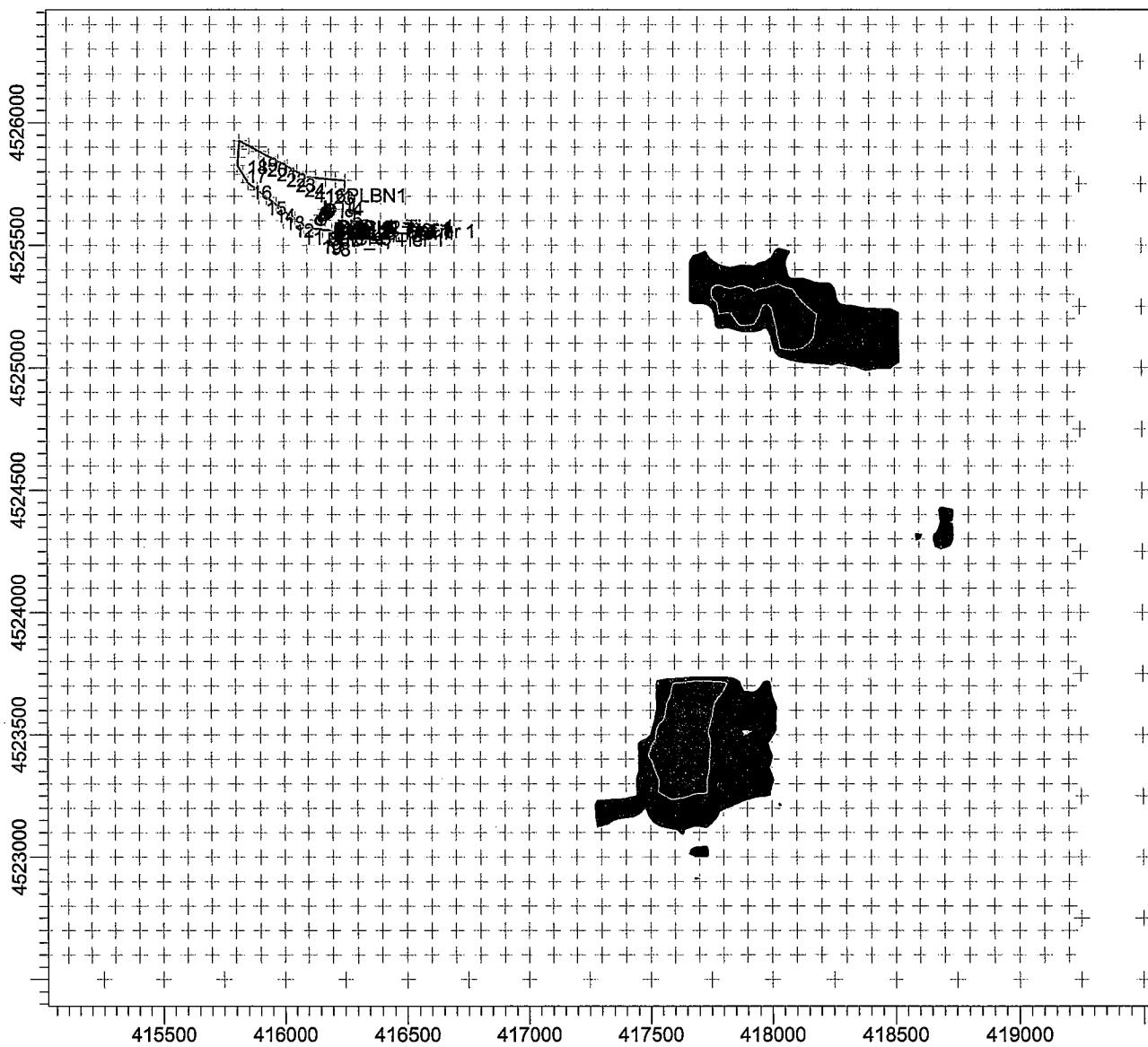
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



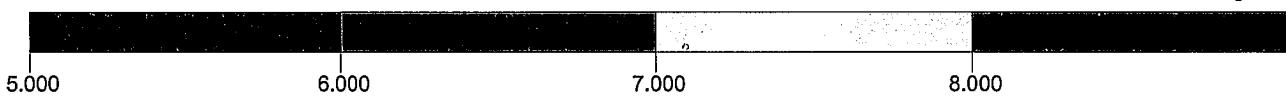
| | | |
|--|--|--|
| COMMENTS: Maximum Impact: 417800 E; 4523700 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 9730 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:54,759 0 [bar] 2 km |
| | MAX: 4.03362 ug/m³ | DATE: 2/7/2006 |
| | PROJECT NO.: | |

PROJECT TITLE:
24-Hour PM10 AAQS Maximum Impact, Meteorological Years 2000 - 04



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

$\mu\text{g}/\text{m}^3$

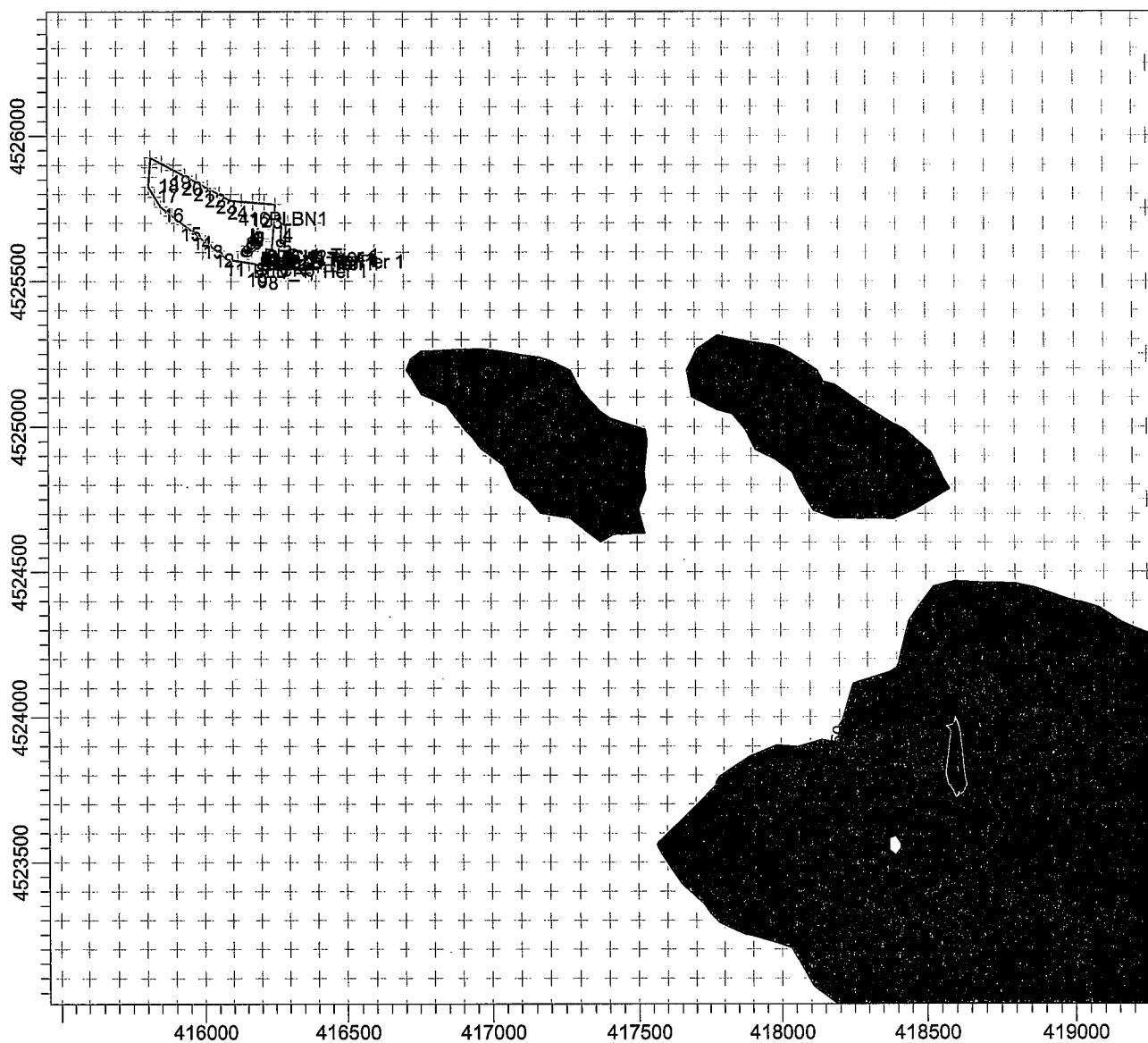


| | | |
|---|--|--|
| COMMENTS: Maximum Impact: 417800 E; 4525300 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 4850 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:27,753 0 1 km |
| | MAX: 8.06371 $\mu\text{g}/\text{m}^3$ | DATE: 2/7/2006 |
| | | PROJECT NO.: |



BLUESCAPE
ENVIRONMENTAL

PROJECT TITLE:
Annual PM10 AAQS Maximum Impact, Meteorological Year 2000



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:
**Maximum Impact:
 418400 E; 4524000 N**

SOURCES:

4

COMPANY NAME:

BlueScape Environmental

RECEPTORS:

4850

MODELER:

Gretchen Jüttner

OUTPUT TYPE:

CONC

SCALE:

1:23,285

0 **0.5 km**



**BLUESCAPE
 ENVIRONMENTAL**

MAX:

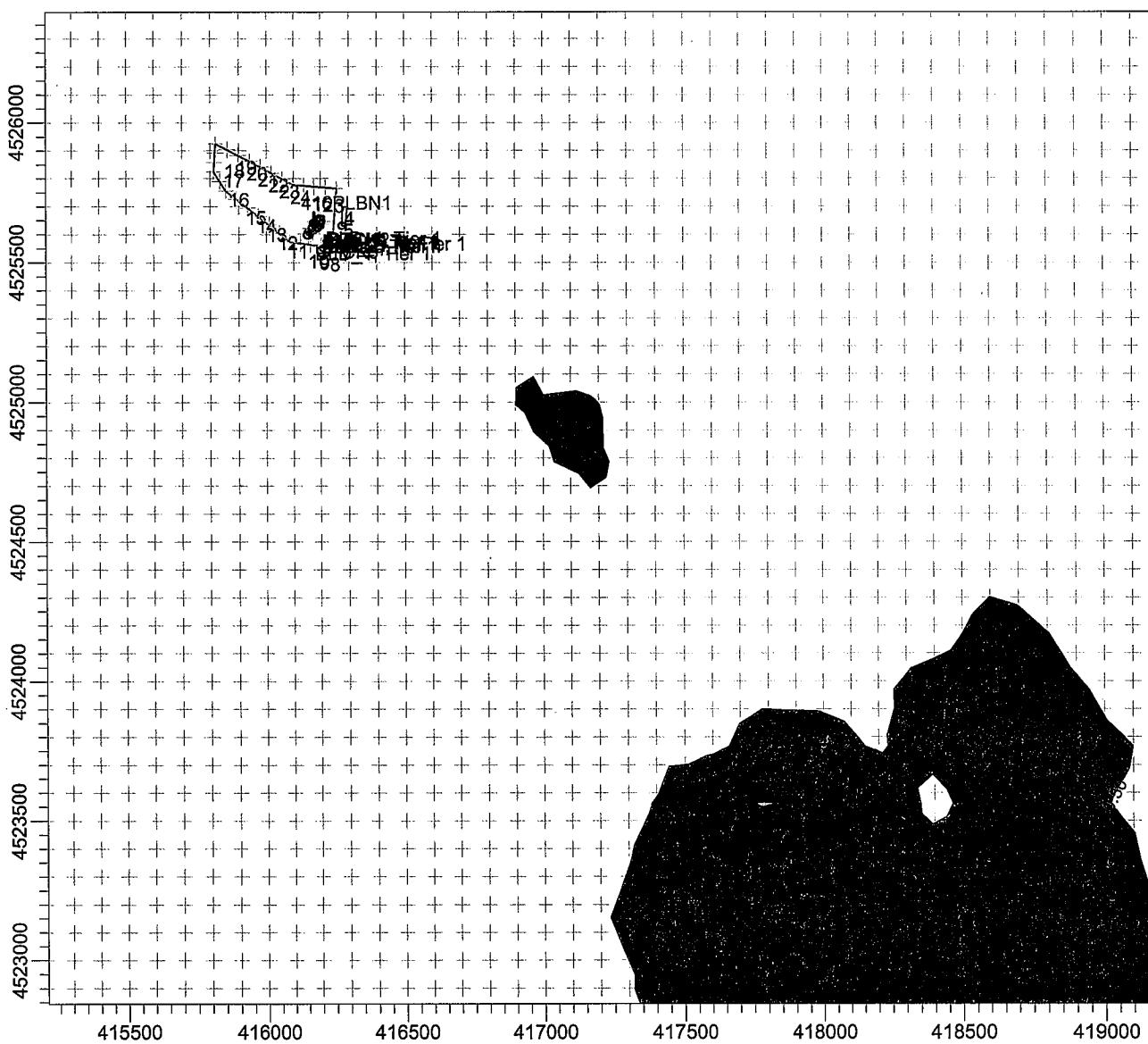
1.14782 ug/m³

DATE:

2/7/2006

PROJECT NO.:

PROJECT TITLE:
Annual PM10 AAQS Maximum Impact, Meteorological Year 2001



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:
**Maximum Impact:
 417700 E; 4523700 N**

SOURCES:
4

COMPANY NAME:
BlueScape Environmental

RECEPTORS:
4850

MODELER:
Gretchen Jüttner



**BLUESCAPE
 ENVIRONMENTAL**

OUTPUT TYPE:
CONC

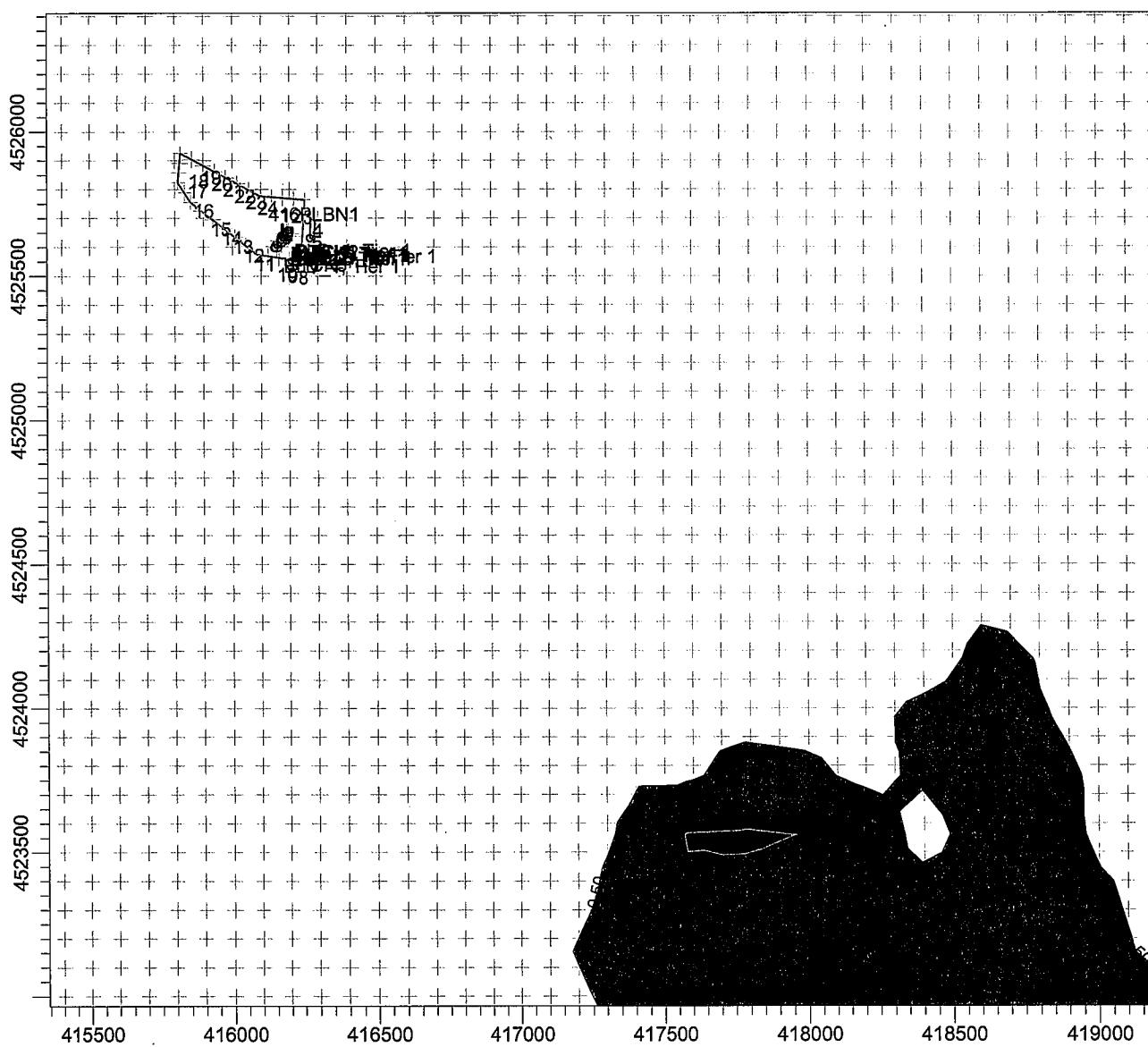
SCALE:
1:24,214
 0 0.5 km

MAX:
1.13515 ug/m³

DATE:
2/7/2006

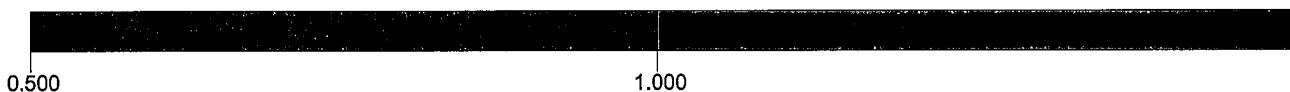
PROJECT NO.:

PROJECT TITLE:
Annual PM10 AAQS Maximum Impact, Meteorological Year 2002



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:
**Maximum Impact:
 417700 E; 4523700 N**

SOURCES:

4

COMPANY NAME:

BlueScape Environmental

RECEPTORS:

4850

MODELER:

Gretchen Jüttner

OUTPUT TYPE:

CONC

SCALE:

1:23,489

MAX:

1.18427 ug/m³

DATE:

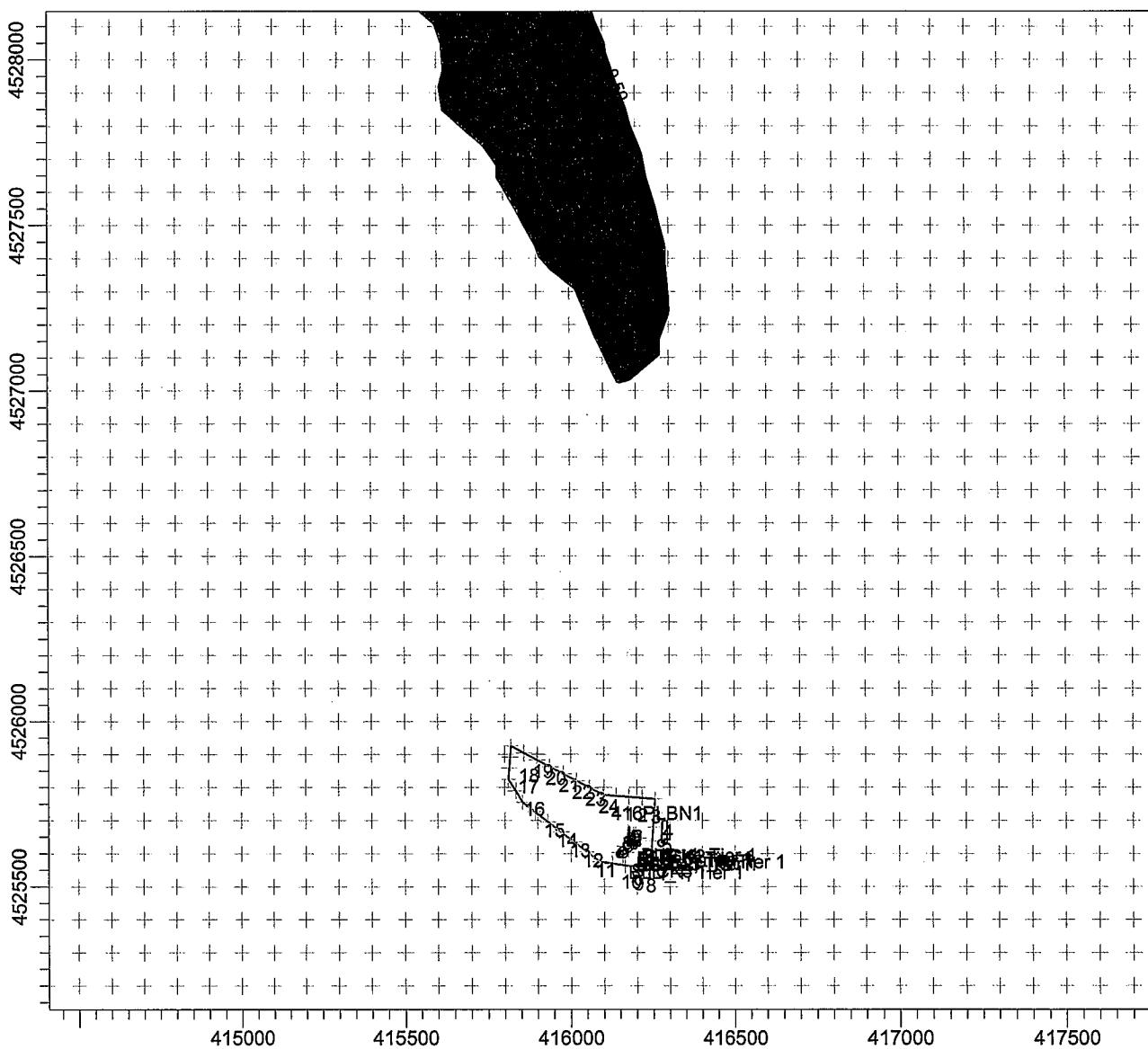
2/7/2006



**BLUESCAPE
 ENVIRONMENTAL**

PROJECT NO.:

PROJECT TITLE:
Annual PM10 AAQS Maximum Impact, Meteorological Year 2003



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:
**Maximum Impact:
 415900 E; 4527600 N**

SOURCES:

4

COMPANY NAME:

BlueScape Environmental

RECEPTORS:

4850

MODELER:

Gretchen Jüttner

OUTPUT TYPE:

CONC

SCALE: 1:20,582

0 0.5 km



MAX:

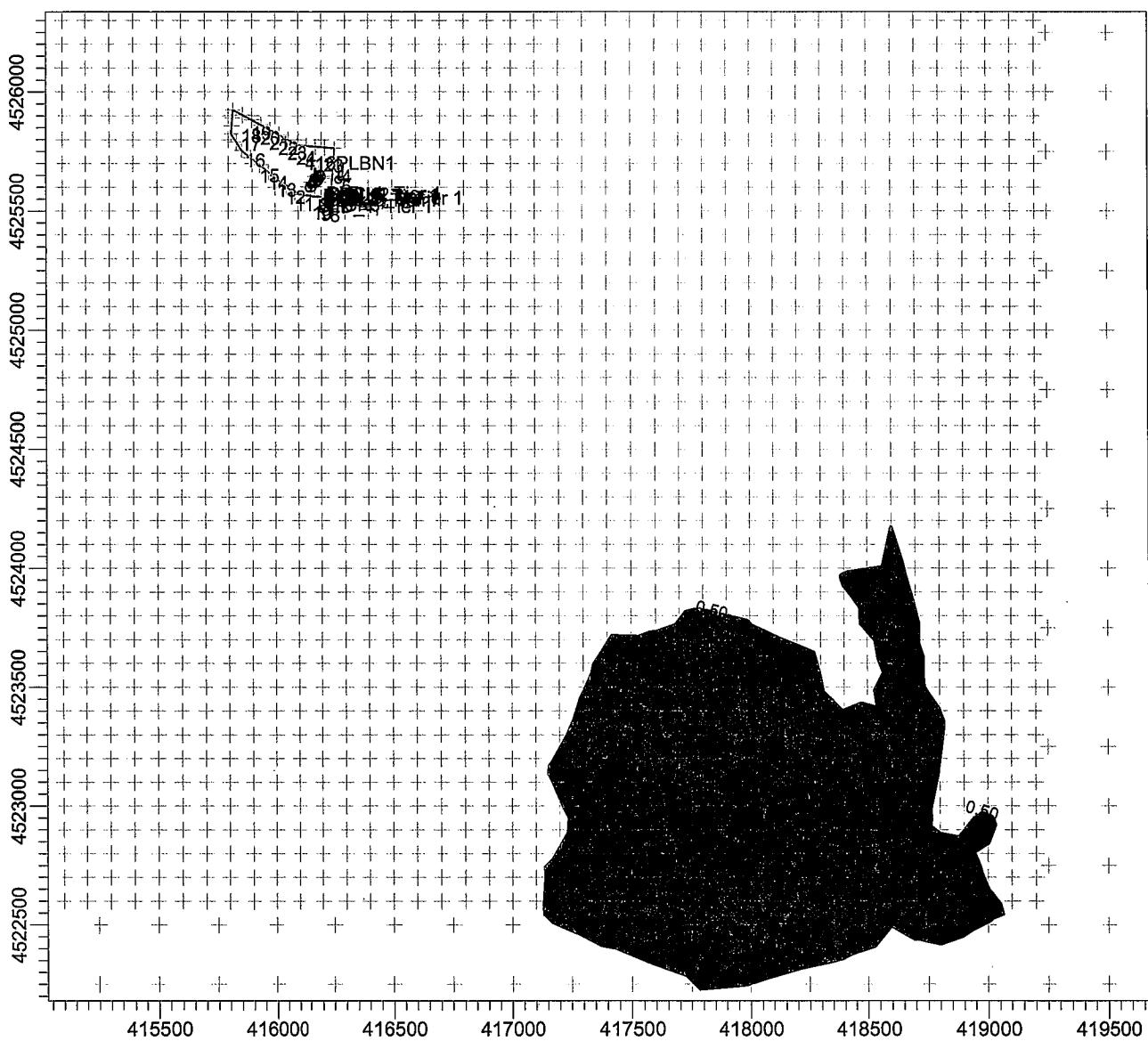
1.00582 ug/m³

DATE:

2/7/2006

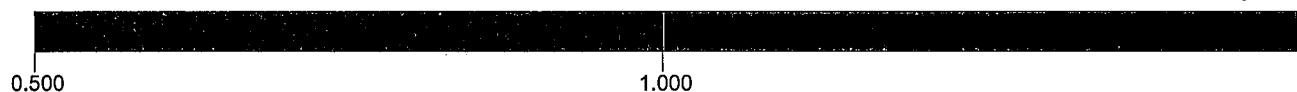
PROJECT NO.:

PROJECT TITLE:
Annual PM10 AAQS Maximum Impact, Meteorological Year 2004



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:
**Maximum Impact:
 417800 E; 4523700 N**

SOURCES:

4

COMPANY NAME:

BlueScape Environmental

RECEPTORS:

4850

MODELER:

Gretchen Jüttner

OUTPUT TYPE:

CONC

SCALE: 1:28,339

0

1 km



MAX:

1.02545 ug/m³

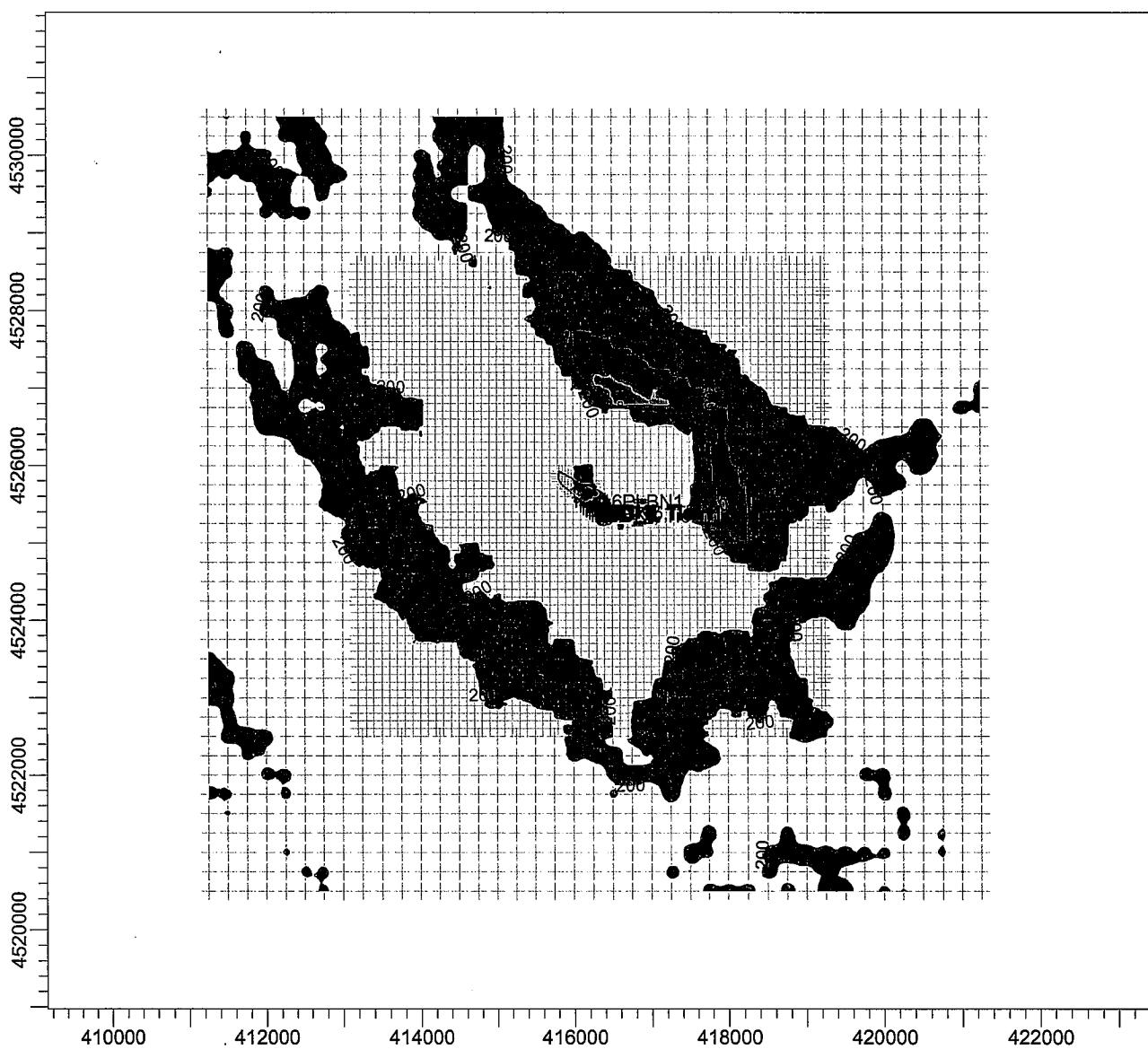
DATE:

2/7/2006

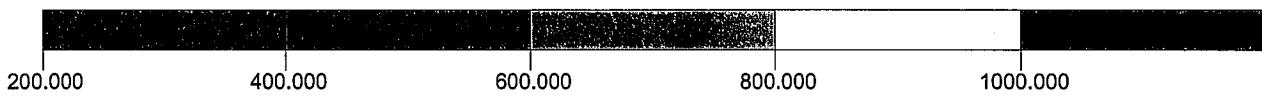
PROJECT NO.:

PROJECT TITLE:

1-Hour CO Significant Impact Area, Meteorological Years 2000 - 04



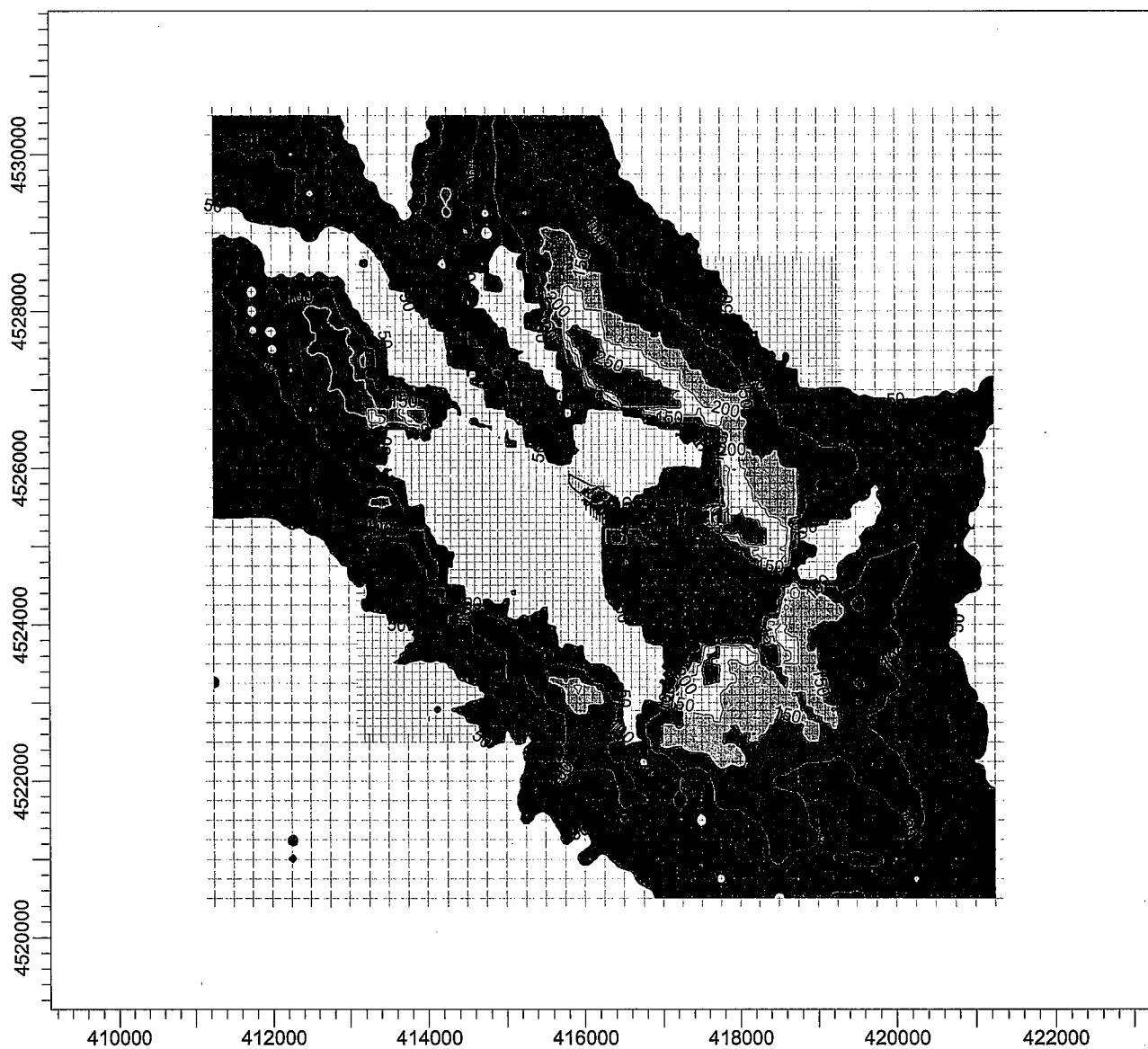
PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

ug/m³

| | | |
|--|-------------------------------------|--|
| COMMENTS: Maximum Impact: 416600 E; 4526800 N SIA = NONE. | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 4850 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:87,735 0 3 km |
| | MAX: 842.42194 ug/m ³ | DATE: 2/7/2006 |
| | | PROJECT NO.: |

B L U E S C A P E
E N V I R O N M E N T A L

PROJECT TITLE:
8-Hour CO Significant Impact Area, Meteorological Years 2000 - 04



PLOT FILE OF HIGH 1ST HIGH 8-HR VALUES FOR SOURCE GROUP: ALL

ug/m³

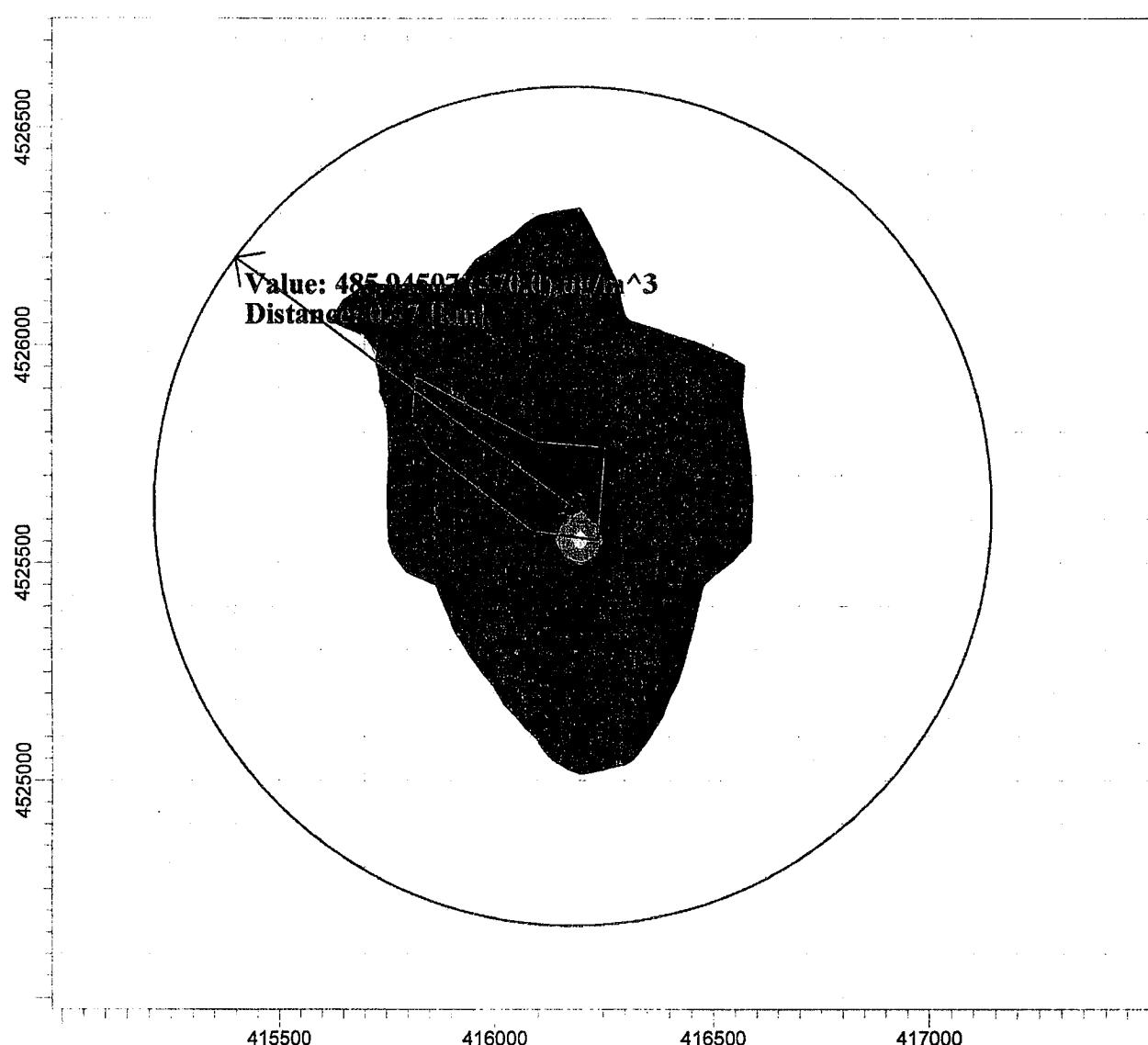


| | | |
|---|--|---|
| COMMENTS: Maximum Impact: 416500 E; 4526900 N SIA = NONE. | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 4850 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:86,923 0  3 km |
| | MAX: 386.93372 ug/m ³ | DATE: 2/7/2006 |
| | | PROJECT NO.: |



BLUESCAPE
ENVIRONMENTAL

PROJECT TITLE:
1-Hour NO_x Significant Impact Area, Meteorological Year 2000 - 04



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:
Maximum Impact:
416201.3 E; 4525558.5 N

SOURCES:

4

COMPANY NAME:

BlueScape Environmental

RECEPTORS:

9730

MODELER:

Gretchen Jüttner

OUTPUT TYPE:

CONC

SCALE:

1:15,534
0 _____ 0.5 km

MAX:

2798.34424 ug/m³

DATE:

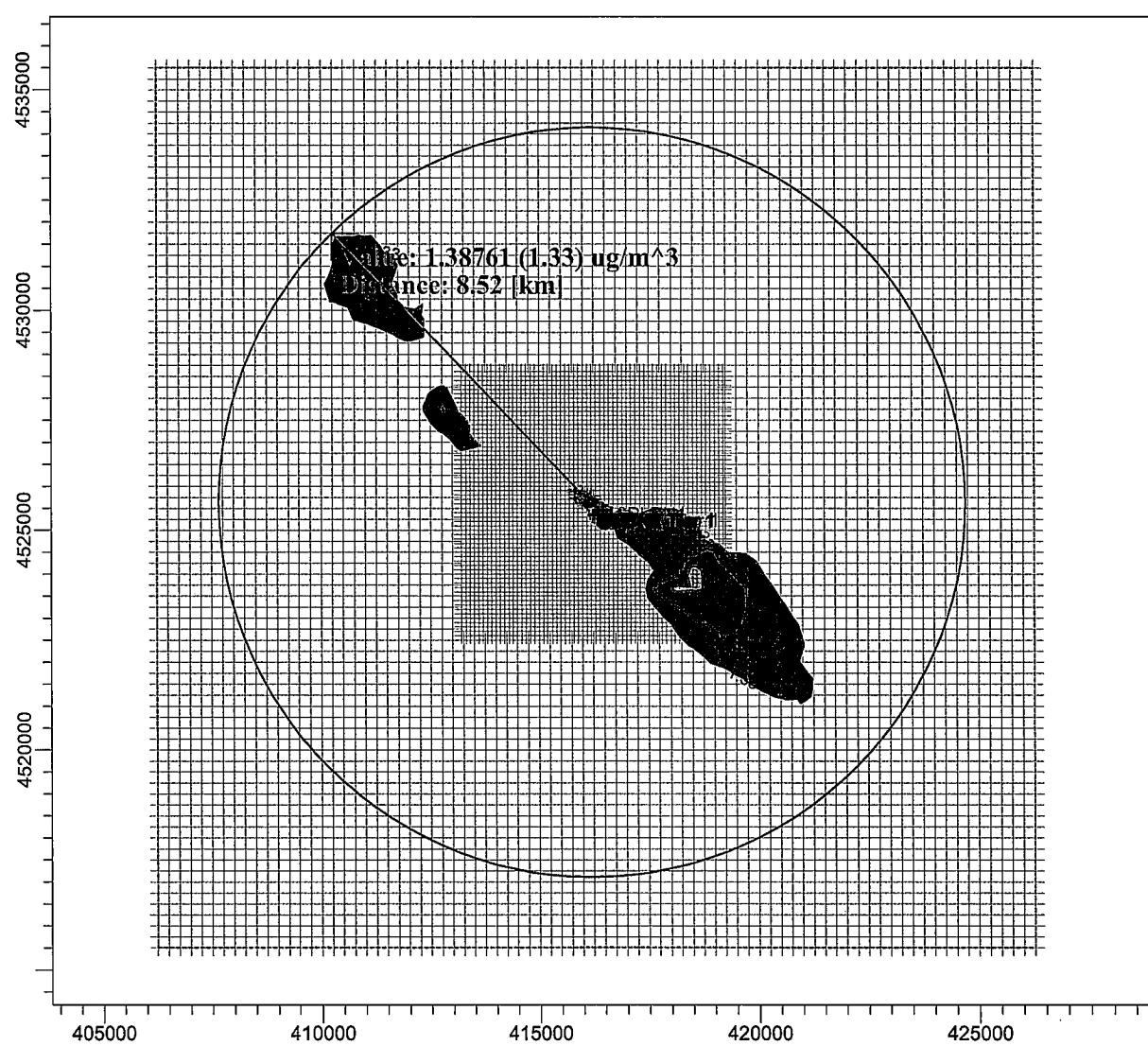
2/7/2006



B L U E S C A P E
E N V I R O N M E N T A L

PROJECT NO.:

PROJECT TITLE:
Annual NO_x Significant Impact Area, Meteorological Year 2000

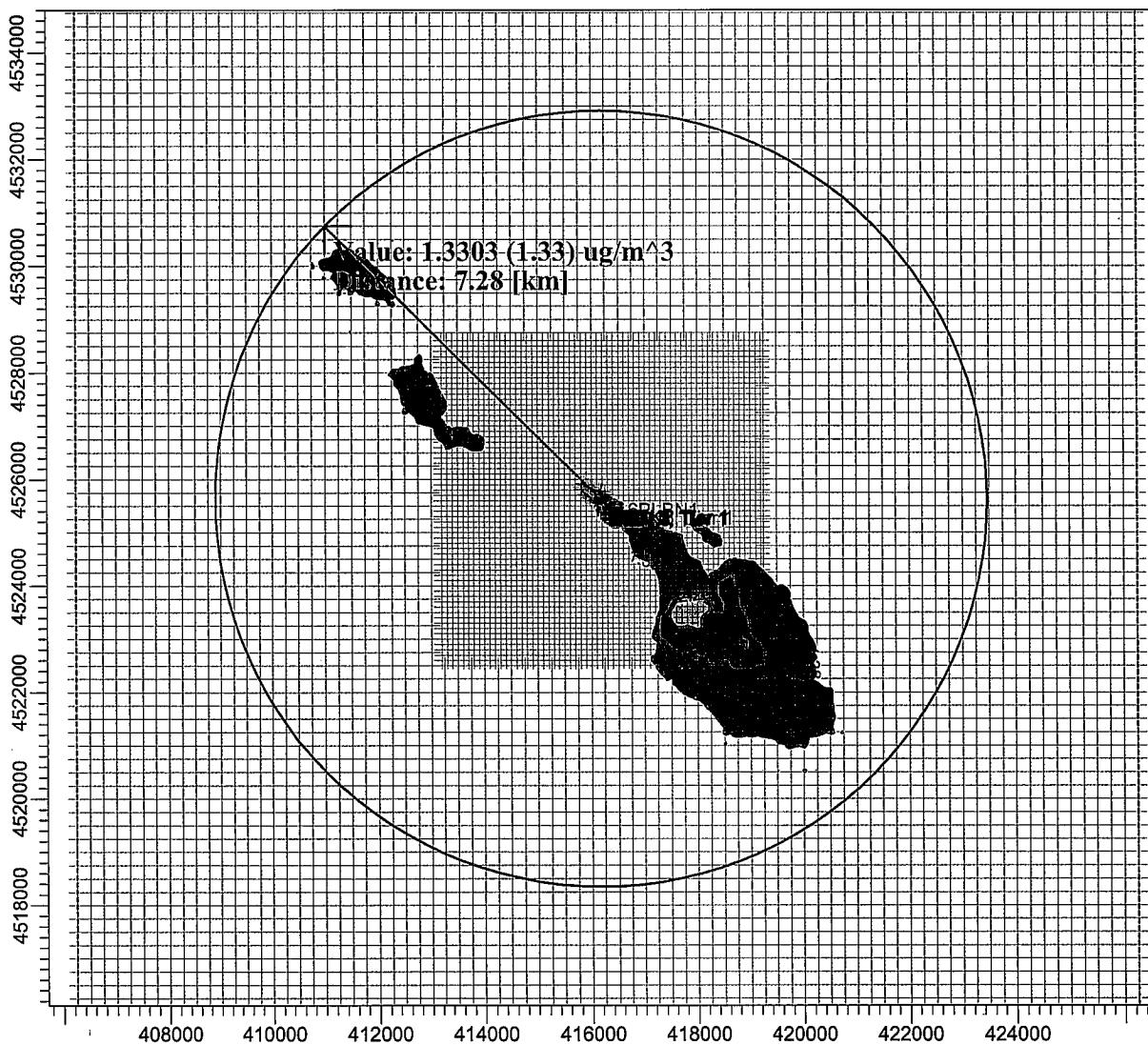


PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL ug/m³



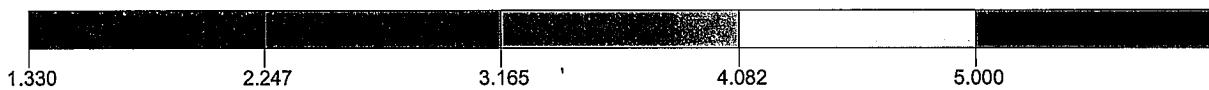
| | | |
|--|--|--|
| COMMENTS: Maximum Impact: 418400 E; 4524000 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 9730 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:153,227 0 _____ 5 km |
| | MAX: 4.528 ug/m ³ | DATE: 2/7/2006 |
| PROJECT NO.: | |  BLUESCAPE ENVIRONMENTAL |

PROJECT TITLE:
Annual NO_x Significant Impact Area, Meteorological Year 2001



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³

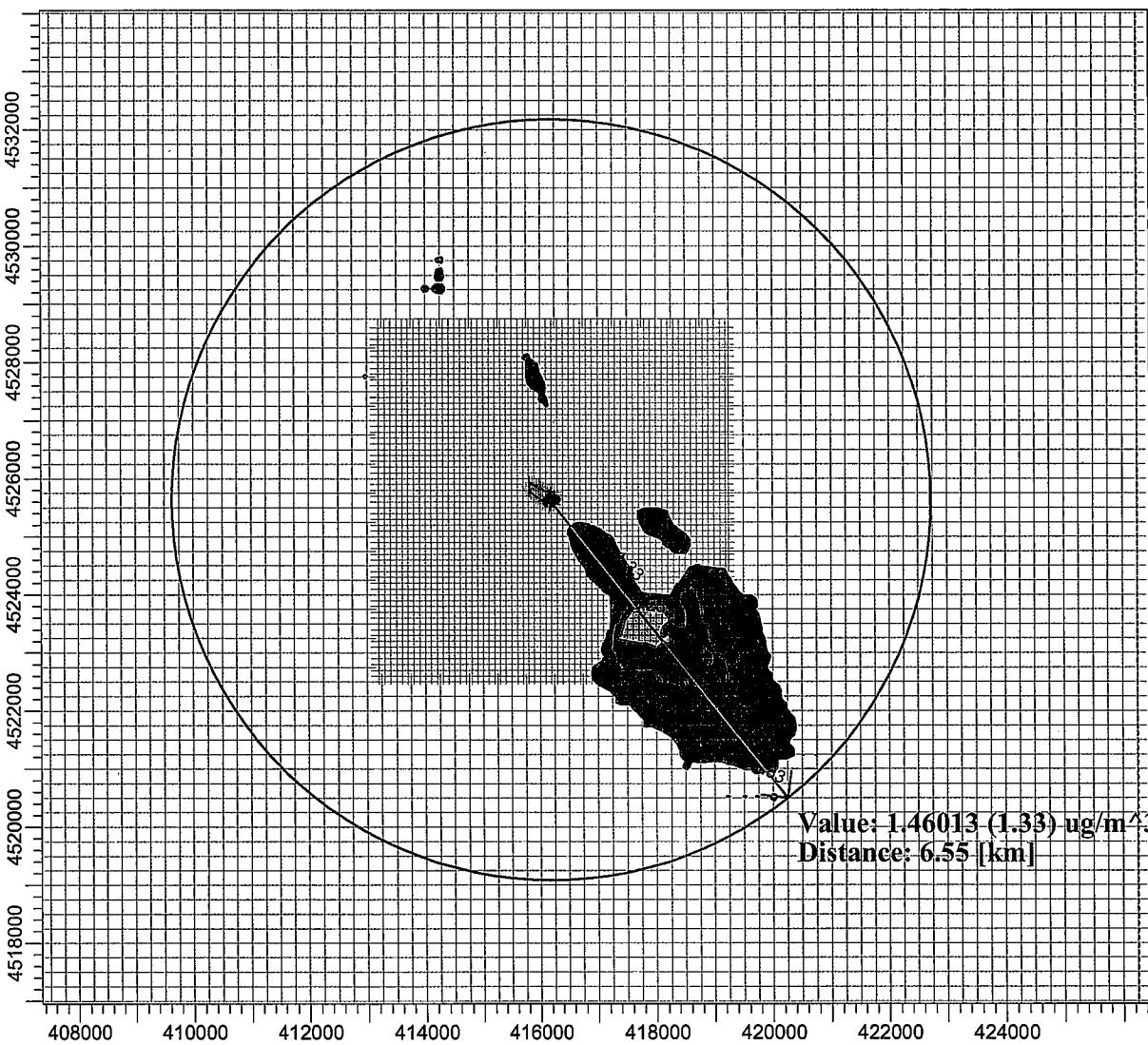


| | | |
|---|-----------------------------------|--|
| COMMENTS: Maximum Impact: 417700 E; 4523700 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 9730 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:127,452 0 5 km |
| | MAX: 4.43653 ug/m ³ | DATE: 2/7/2006 |
| | | PROJECT NO.: |



BLUESCAPE
ENVIRONMENTAL

PROJECT TITLE:
Annual NO_x Significant Impact Area, Meteorological Year 2002



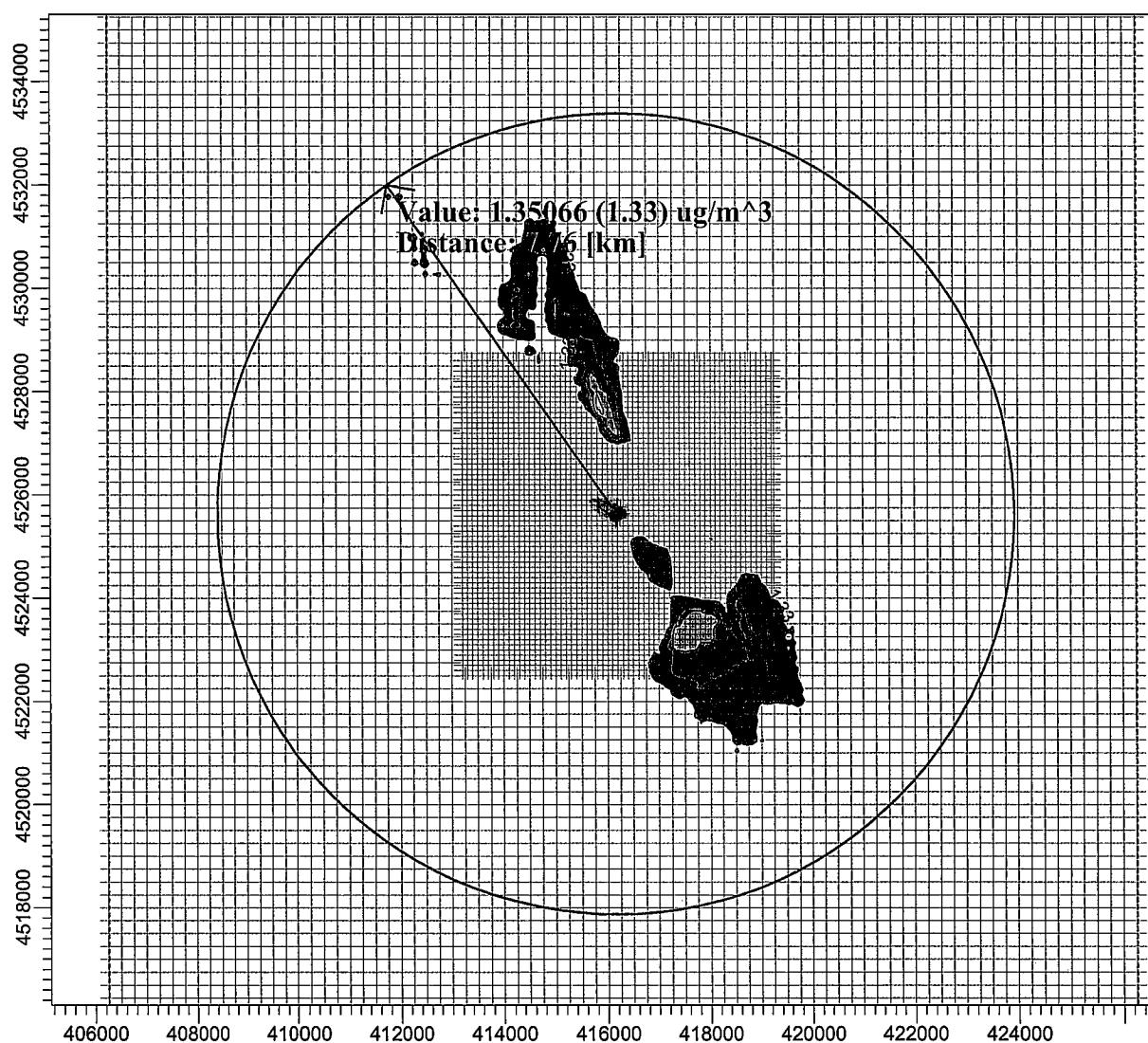
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



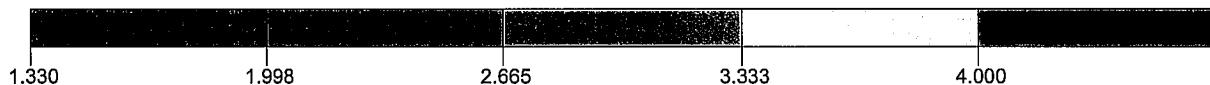
| | | |
|---|-----------------------------------|---|
| COMMENTS: Maximum Impact: 417700 E; 4523700 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 9730 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:116,629 0 4 km |
| | MAX: 4.63336 ug/m ³ | DATE: 2/7/2006 |
| PROJECT NO.: | |  BLUESCAPE ENVIRONMENTAL |

PROJECT TITLE:
Annual NO_x Significant Impact Area, Meteorological Year 2003



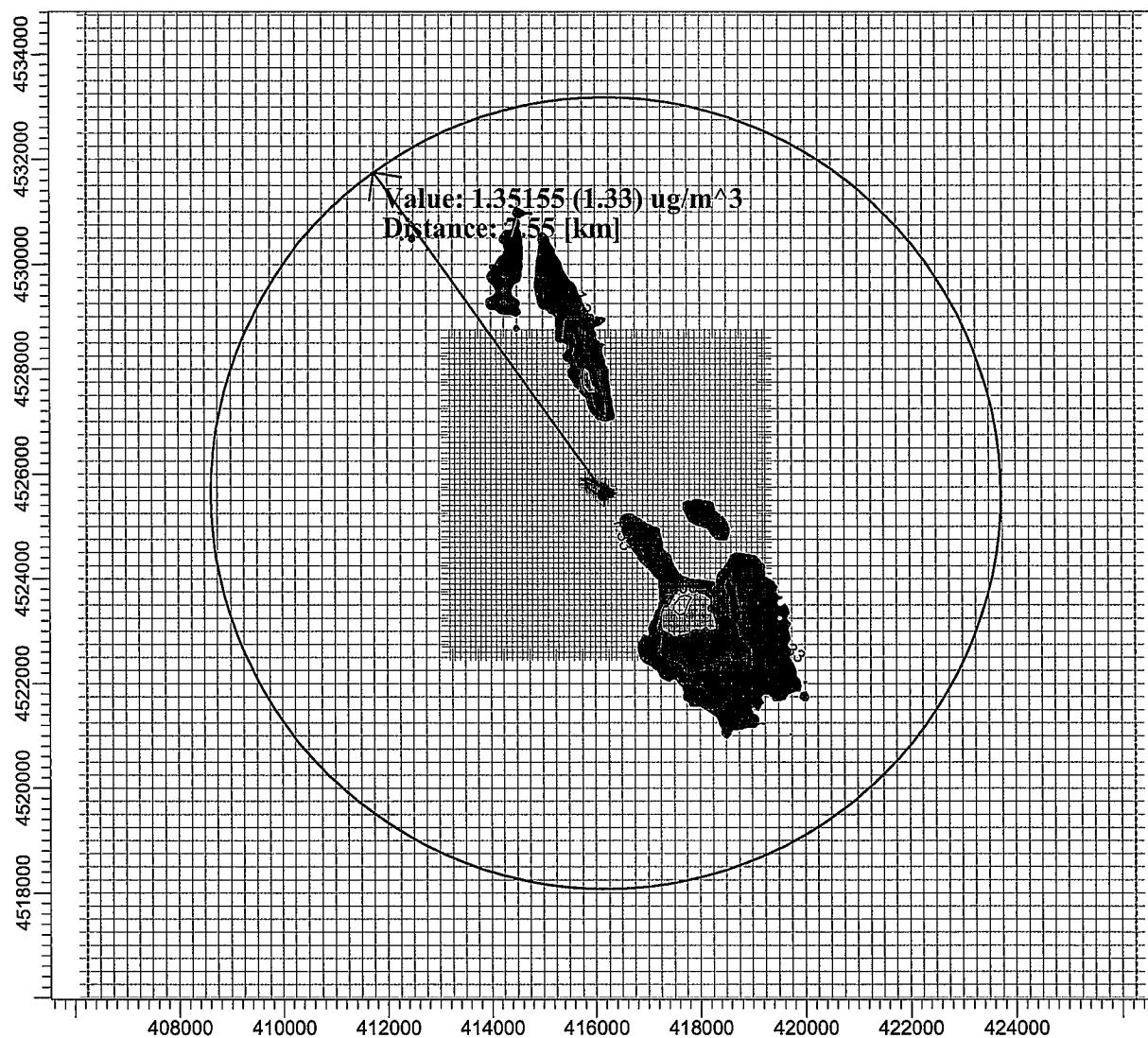
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



| | | |
|---|---------------------------------------|---|
| COMMENTS: Maximum Impact: 415900 E; 4527600 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 9730 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:130,907 0 5 km |
| | MAX: 3.98038 ug/m ³ | DATE: 2/7/2006 |
| PROJECT NO.: | |  BLUESCAPE ENVIRONMENTAL |

PROJECT TITLE:
Annual NO_x Significant Impact Area, Meteorological Year 2004

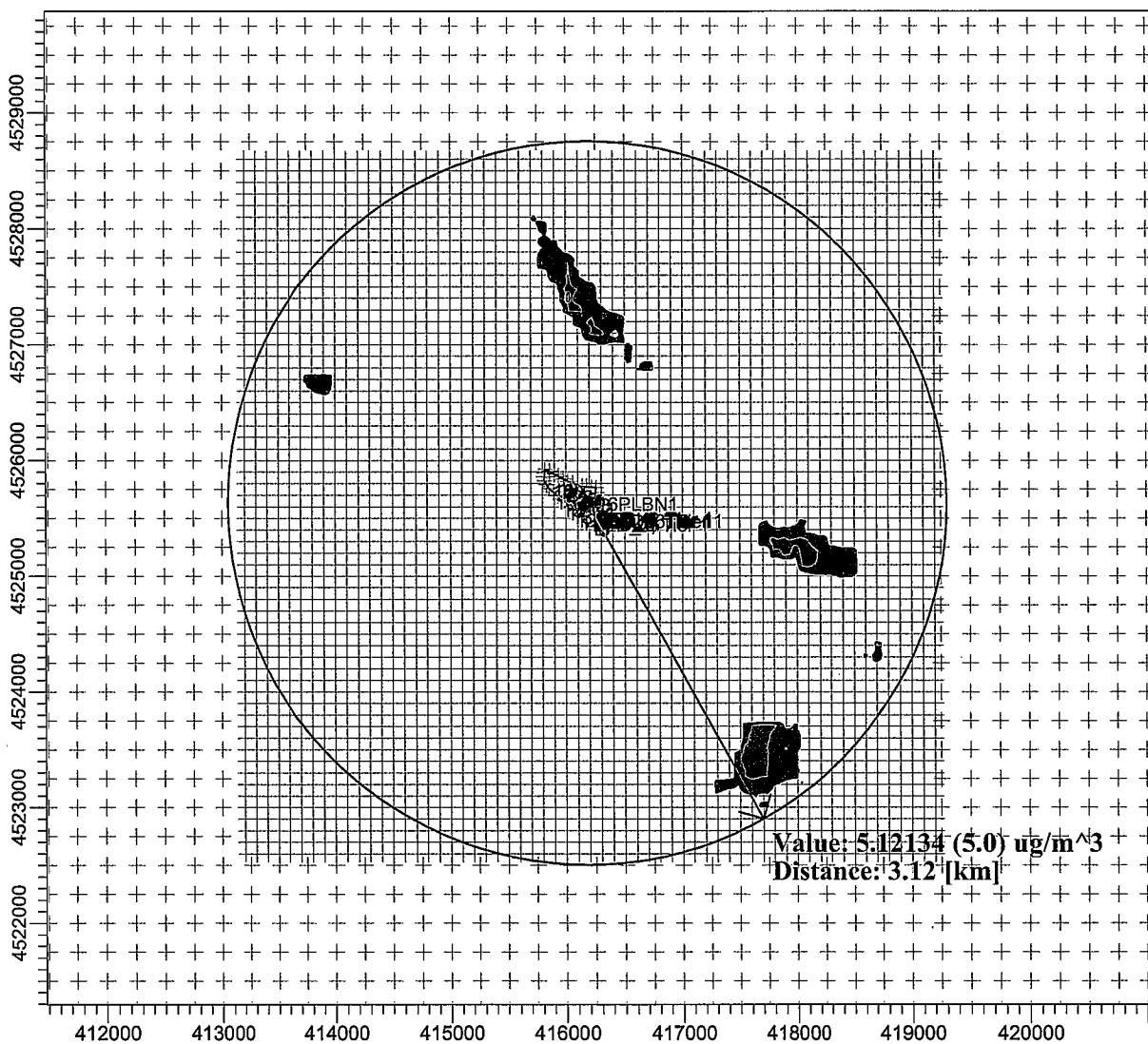


PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL ug/m³

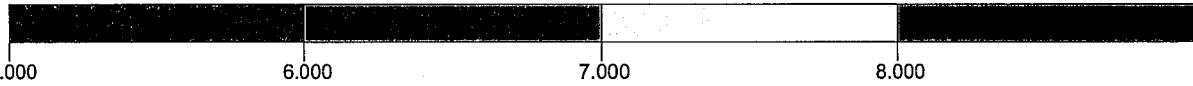


| | | |
|--|---|--|
| COMMENTS: Maximum Impact: 417800 E; 4523700 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 9730 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:128,576 0 5 km |
| | MAX: 4.03362 ug/m³ | DATE: 2/7/2006 |
| PROJECT NO.: | |  BLUESCAPE ENVIRONMENTAL |

PROJECT TITLE:
24-Hour PM10 Significant Impact Area, Meteorological Years 2000 - 04

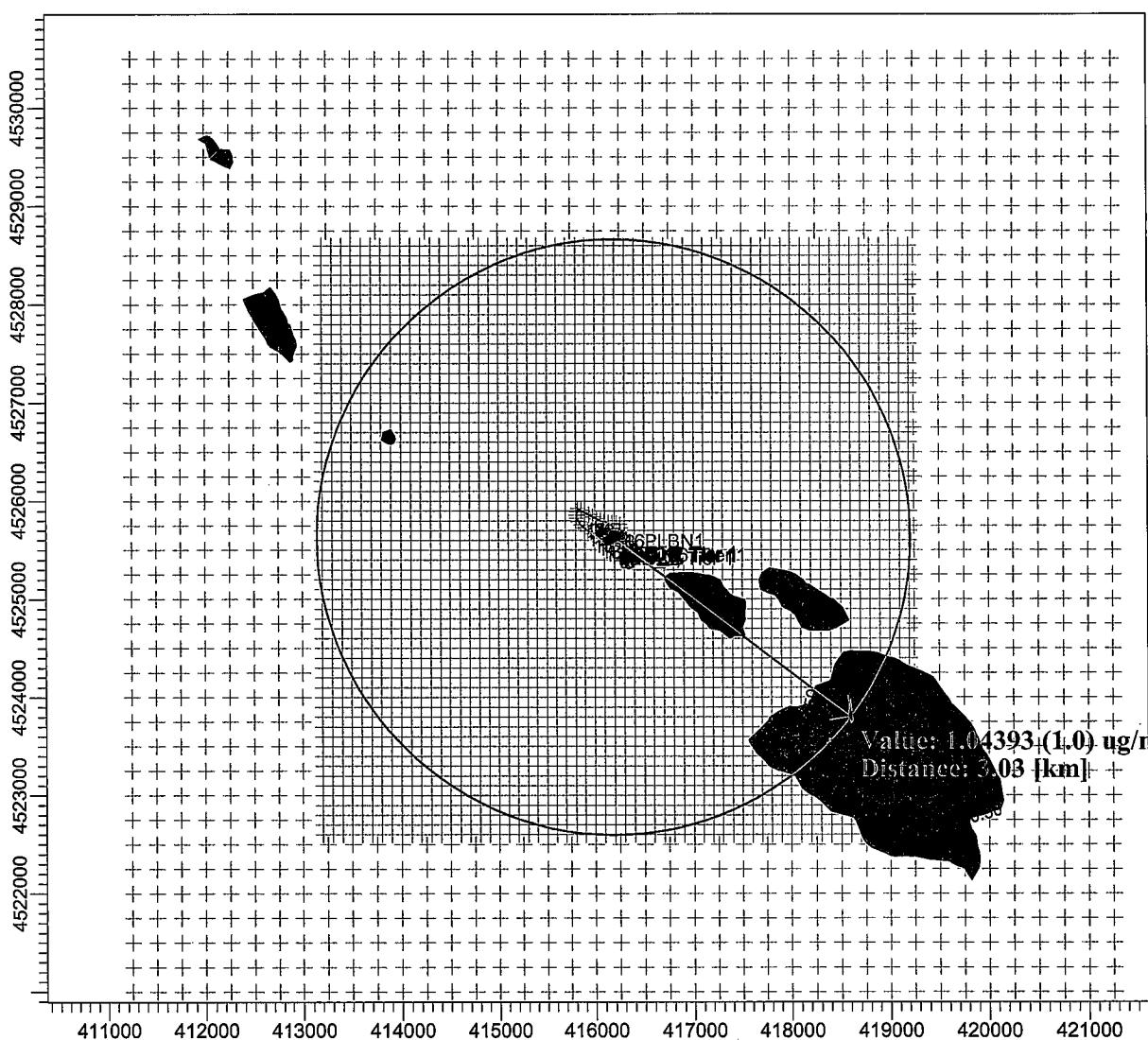


PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m³



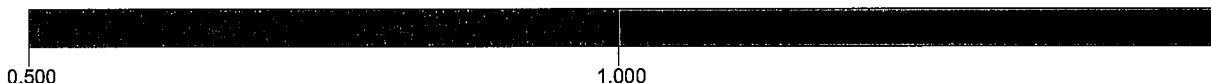
| | | |
|--|--------------------------------------|--|
| COMMENTS: Maximum Impact: 417800 E; 4525300 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 4850 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:58,532 0  2 km |
| | MAX: 8.06371 ug/m^3 | DATE: 2/7/2006 |
| | |  BLUESCAPE ENVIRONMENTAL |

PROJECT TITLE:
Annual PM10 Significant Impact Area, Meteorological Year 2000



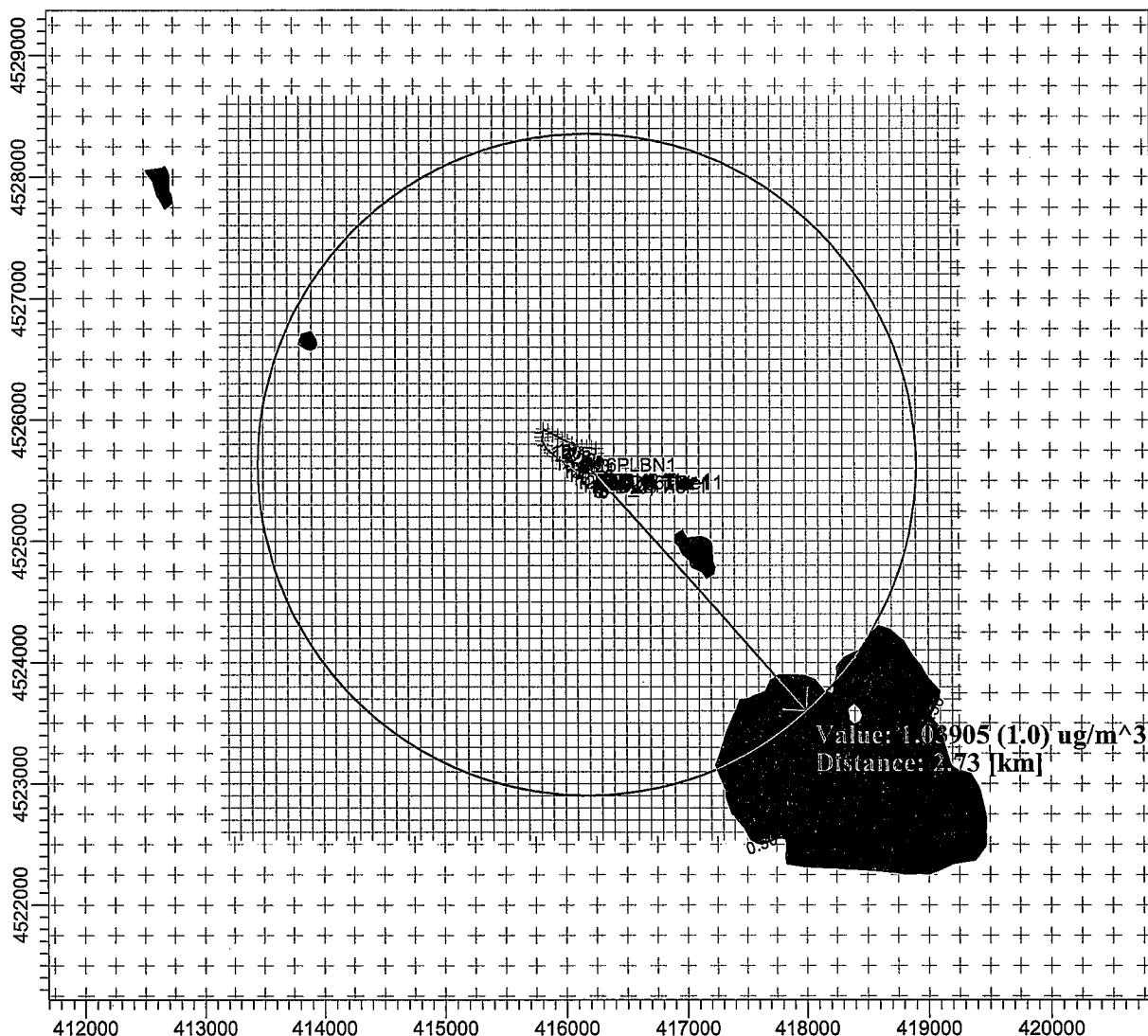
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



| | | |
|--|--|---|
| COMMENTS: Maximum Impact: 418400 E; 4524000 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 4850 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:68,622 0 2 km |
| | MAX: 1.14782 ug/m ³ | DATE: 2/7/2006 |
| | PROJECT NO.: | |

PROJECT TITLE:
Annual PM10 Significant Impact Area, Meteorological Year 2001



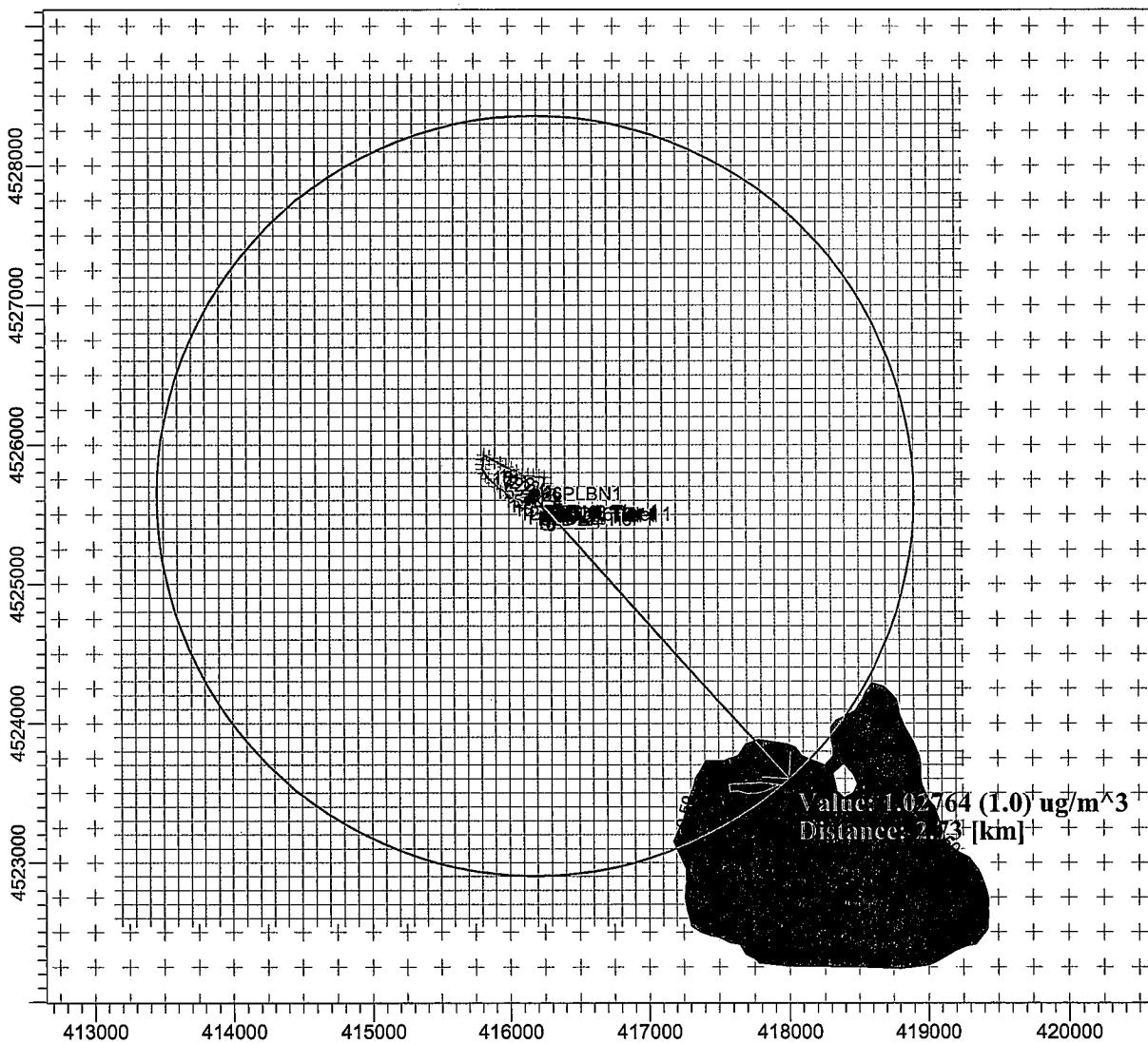
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



| | | |
|--|--|---|
| COMMENTS: Maximum Impact: 417700 E; 4523700 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 4850 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:55,628 0 2 km |
| | MAX: 1.13515 ug/m ³ | DATE: 2/7/2006 |
| | PROJECT NO.: | |

**PROJECT TITLE:
Annual PM10 Significant Impact Area, Meteorological Year 2002**



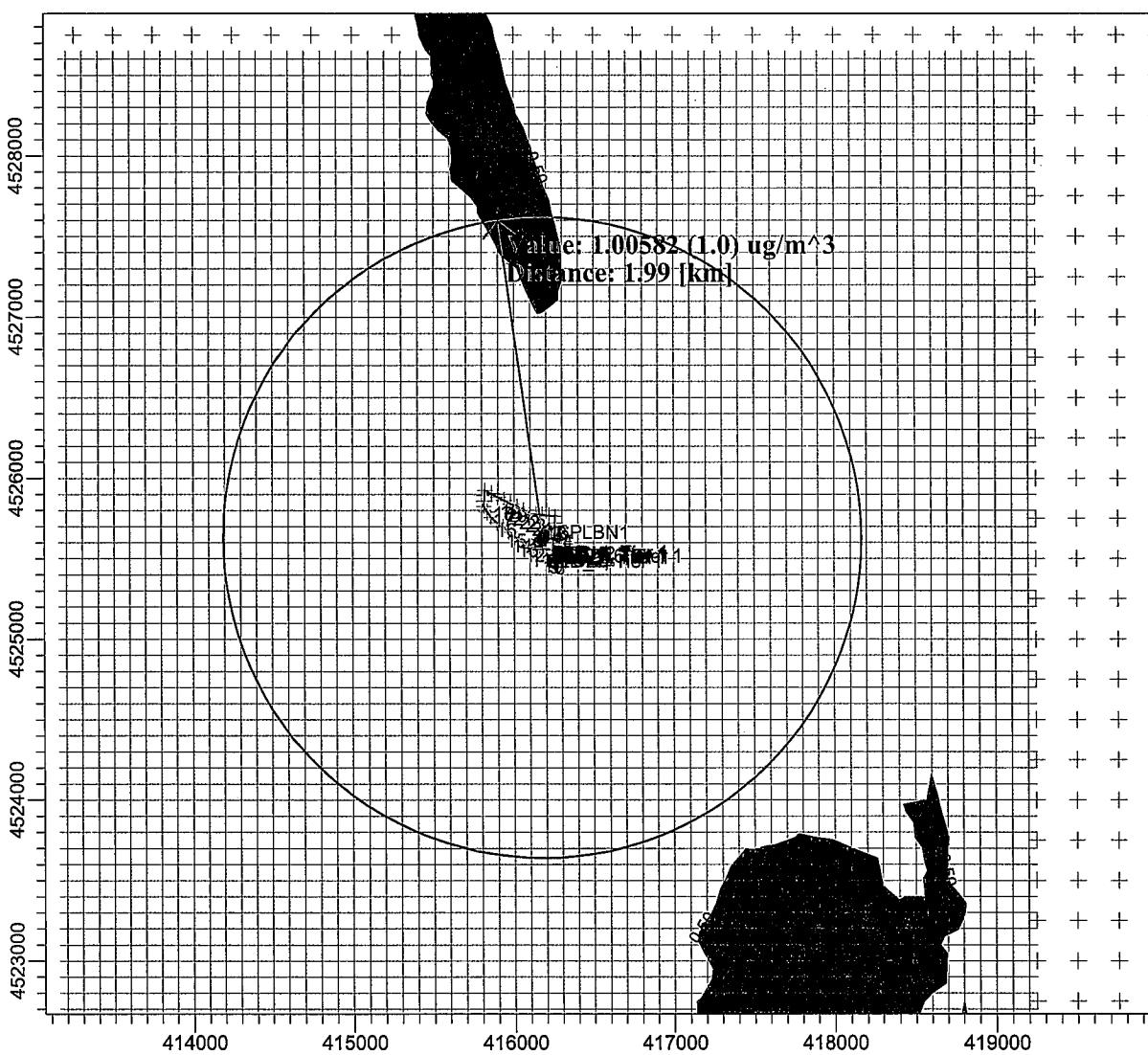
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



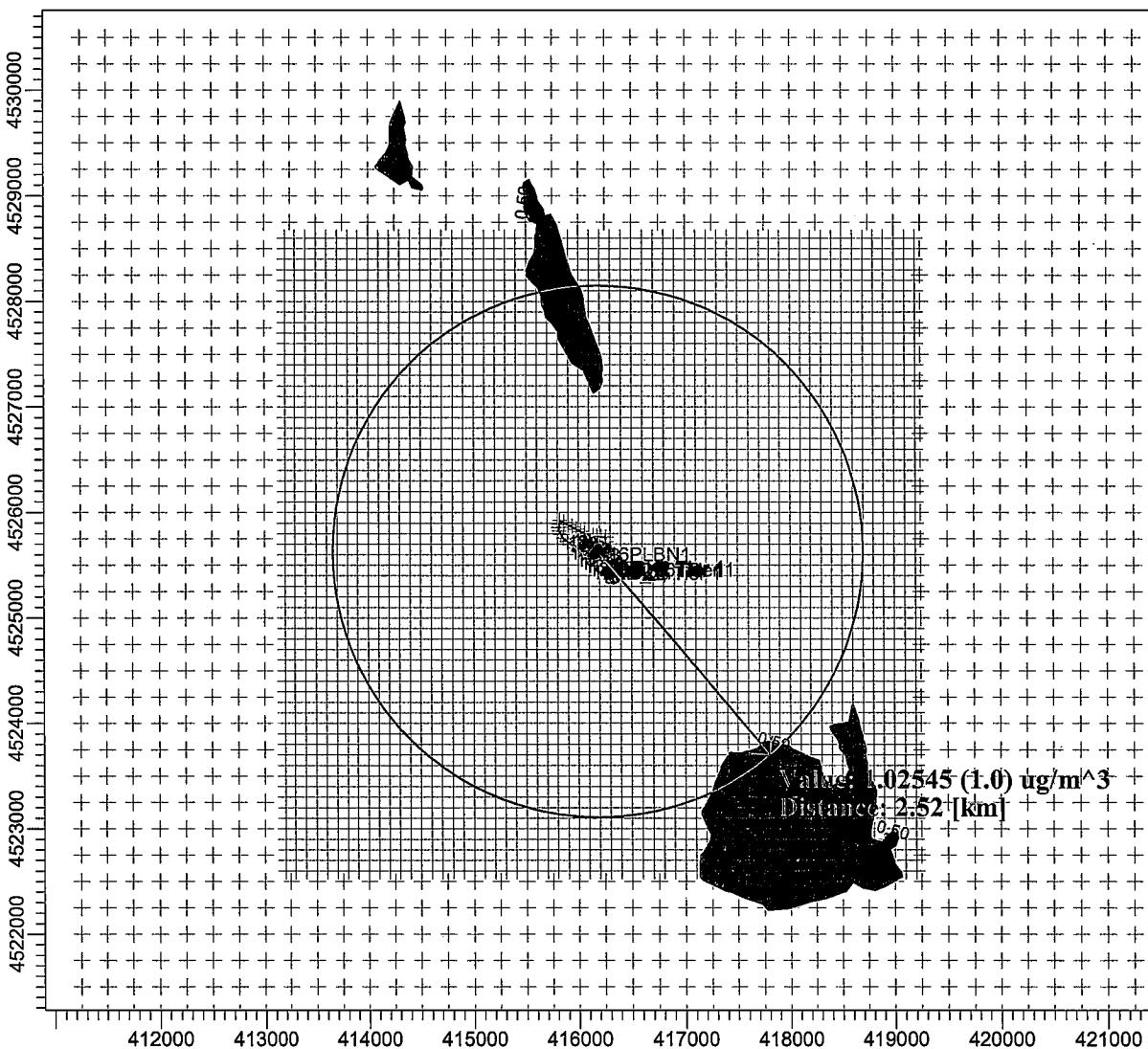
| | | | |
|--|-------------------|-------------------------|--|
| COMMENTS: Maximum Impact: 417700 E; 4523700 N | SOURCES: | COMPANY NAME: | |
| | 4 | BlueScape Environmental | |
| | RECEPTORS: | MODELER: |  BLUESCAPE ENVIRONMENTAL |
| | 4850 | Gretchen Jüttner | |
| OUTPUT TYPE: | SCALE: | 1:48,617 |  |
| CONC | 0 | 1 km | |
| MAX: | DATE: | PROJECT NO.: | |
| 1.18427 ug/m ³ | 2/7/2006 | | |

PROJECT TITLE:
Annual PM10 Significant Impact Area, Meteorological Year 2003



| | | |
|--|---|--|
| COMMENTS: Maximum Impact: 415900 E; 4527600 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 4850 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:42,373 0 1 km |
| | MAX: 1.00582 ug/m^3 | DATE: 2/7/2006 |
| PROJECT NO.: | |  BLUESCAPE ENVIRONMENTAL |

PROJECT TITLE:
Annual PM10 Significant Impact Area, Meteorological Year 2004



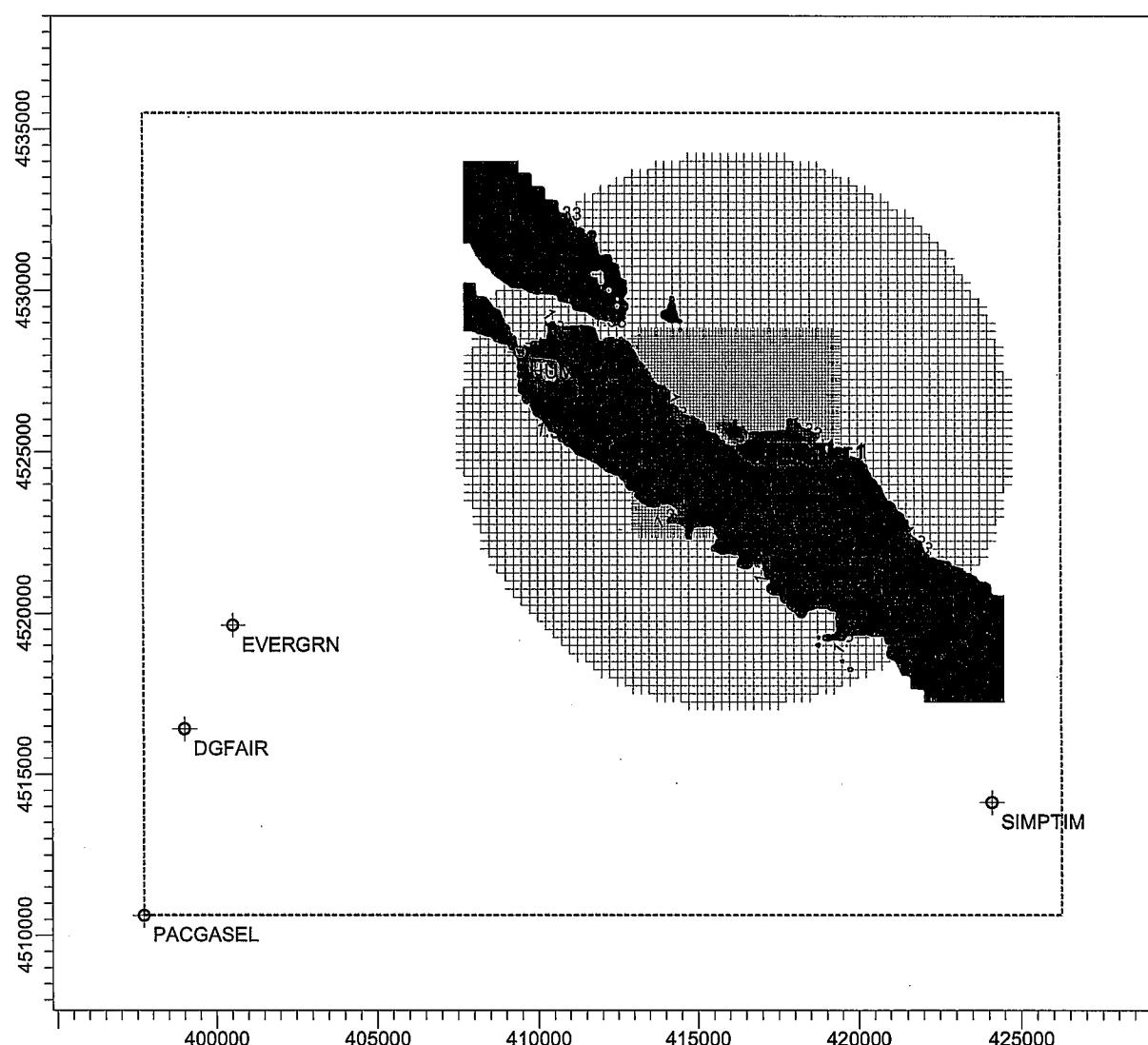
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

$\mu\text{g}/\text{m}^3$



| | | |
|---|--|--|
| COMMENTS: Maximum Impact: 417800 E; 4523700 N | SOURCES: 4 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 4850 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:64,672 0 2 km |
| | MAX: 1.02545 $\mu\text{g}/\text{m}^3$ | DATE: 2/7/2006 |
| | PROJECT NO.: | |

PROJECT TITLE:
Annual NOx PSD Increment, Meteorological Year 2000



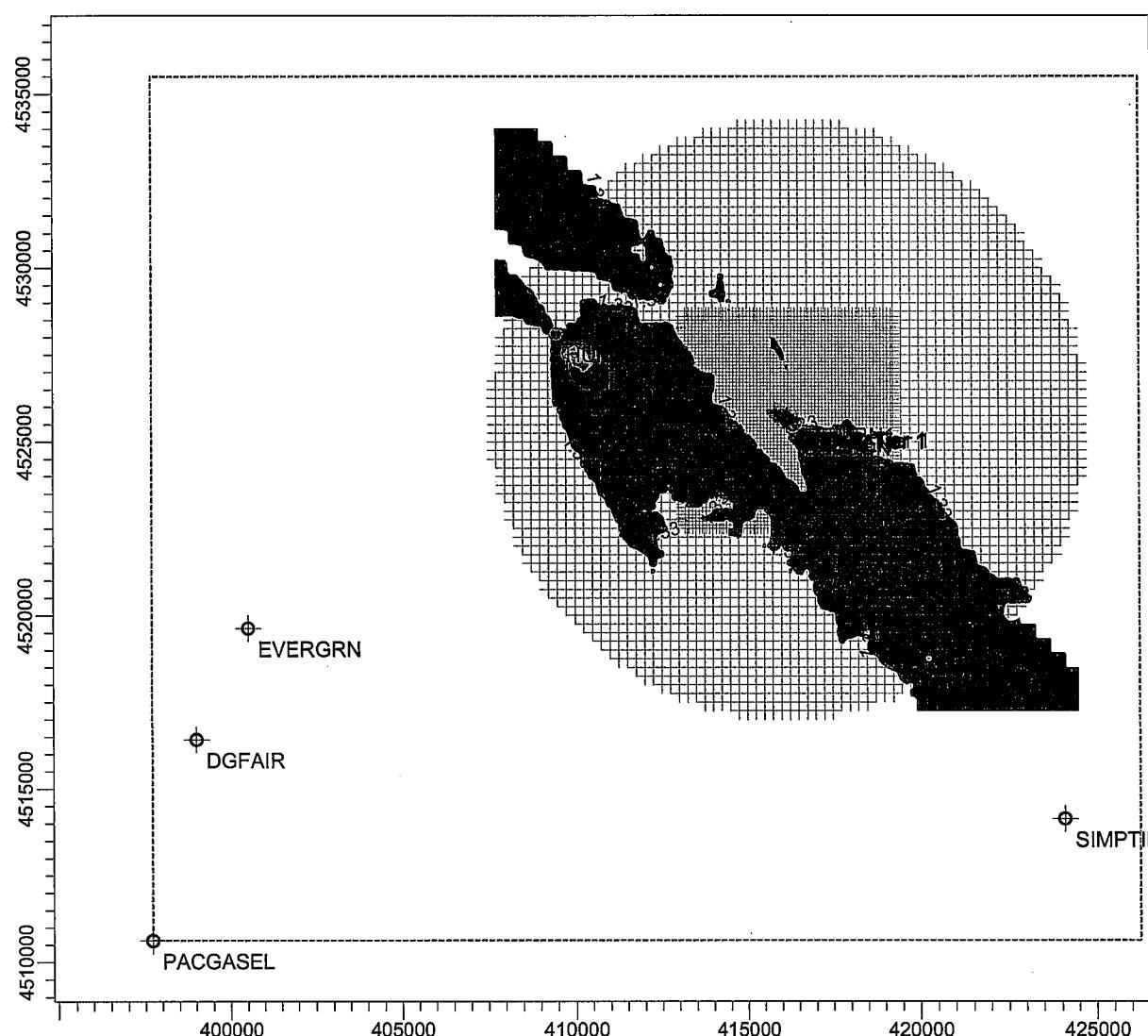
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



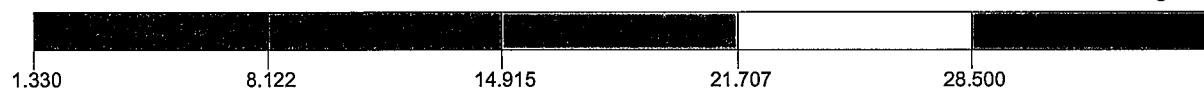
| | | |
|--|---|--|
| COMMENTS: Maximum Impact: 410250 E; 4527500 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 6817 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:210,281 0 5 km |
| | MAX: 31.4485 ug/m³ | DATE: 2/8/2006 |
| PROJECT NO.: | |  BLUESCAPE ENVIRONMENTAL |

PROJECT TITLE:
Annual NOx PSD Increment, Meteorological Year 2001



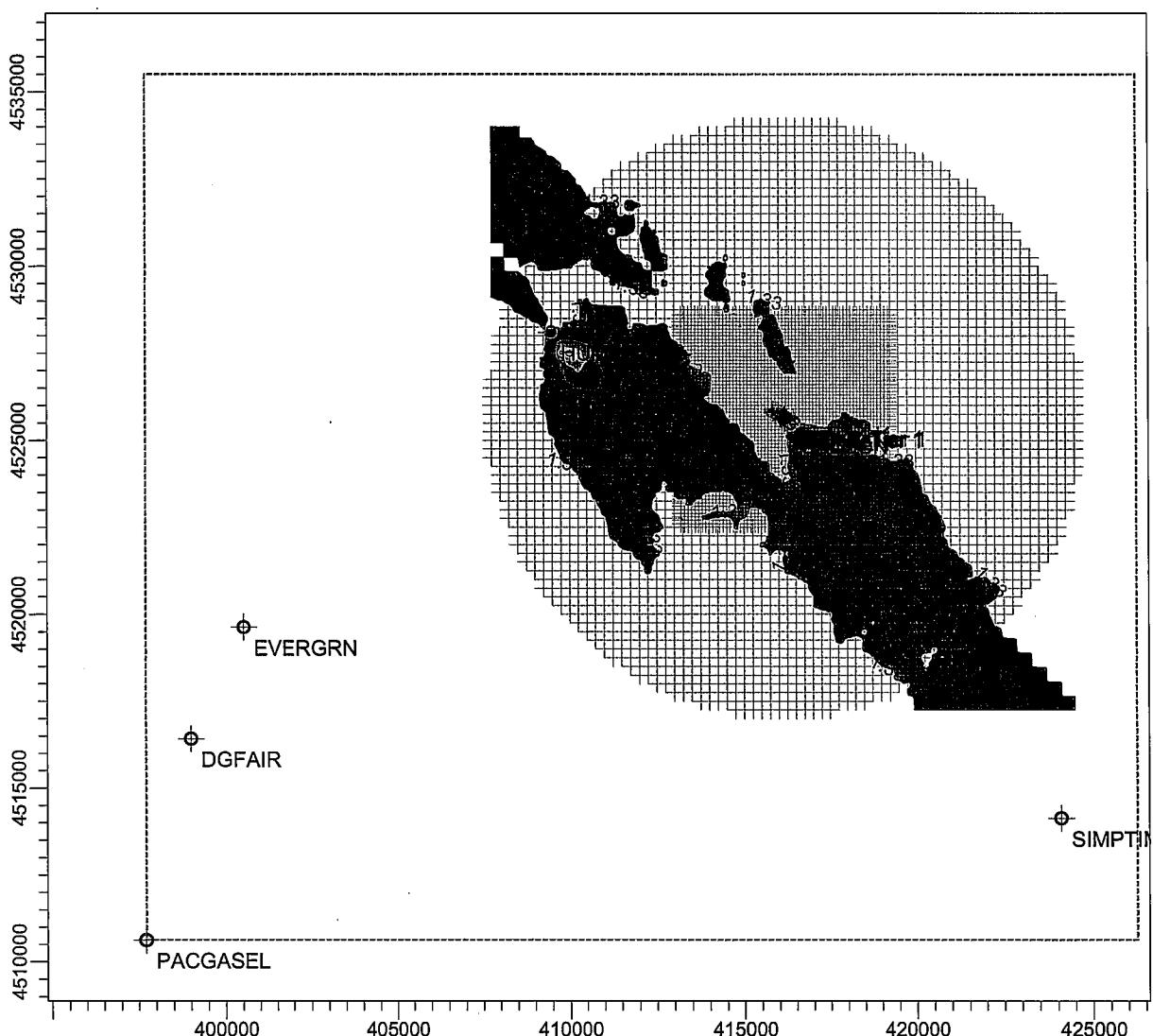
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



| | | |
|---|------------------------------------|--|
| COMMENTS: Maximum Impact: 410000 E; 4527500 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 6817 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:193,615 0 5 km |
| | MAX: 28.48194 ug/m ³ | DATE: 2/8/2006 |
| PROJECT NO.: | |  BLUESCAPE ENVIRONMENTAL |

PROJECT TITLE:
Annual NOx PSD Increment, Meteorological Year 2002



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³

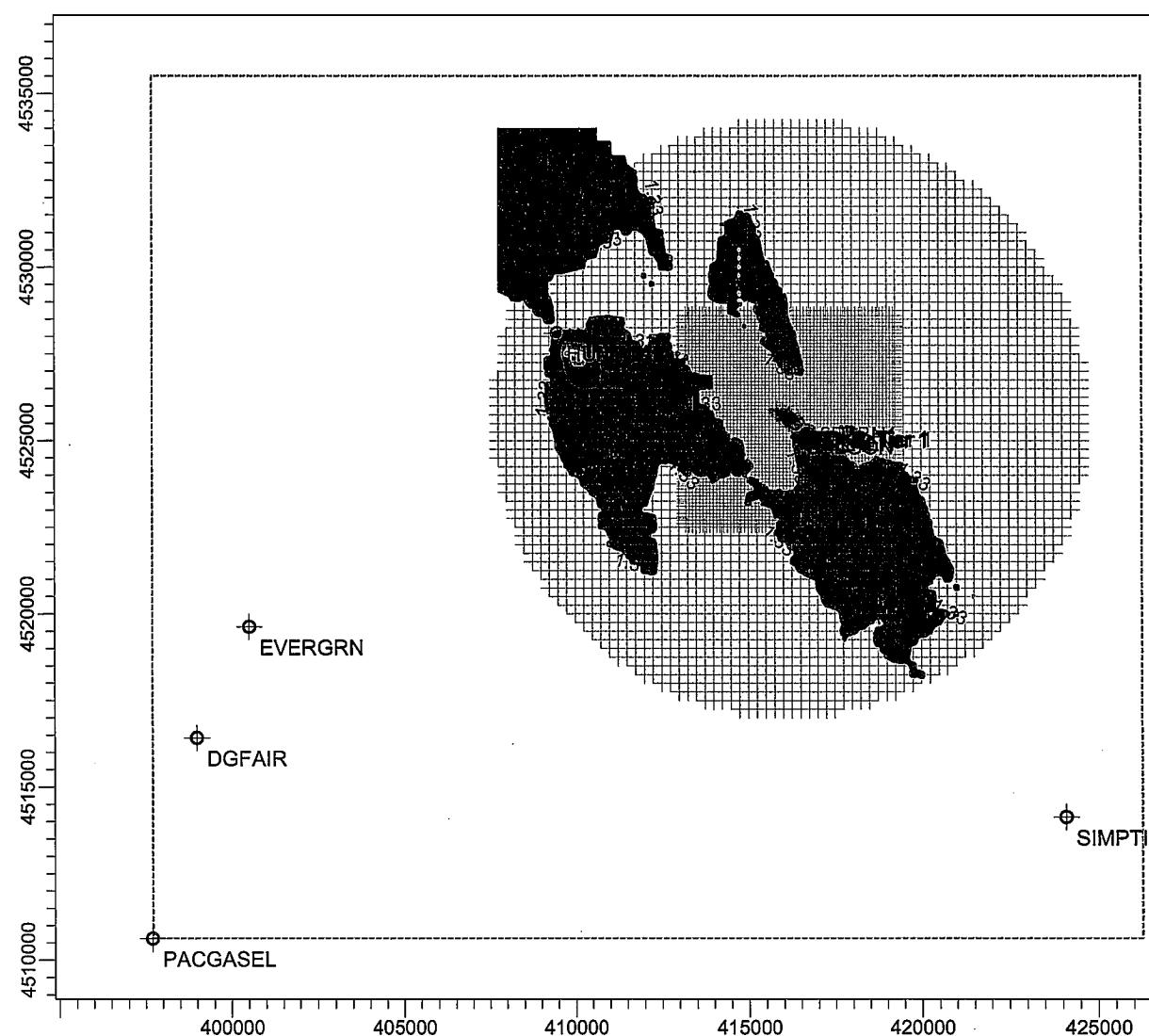


| | | |
|--|---|--|
| COMMENTS: Maximum Impact: 410000 E; 4527500 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 6817 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:193,615 0 5 km |
| | MAX: 28.58995 ug/m³ | DATE: 2/8/2006 |
| | PROJECT NO.: | |



BLUESCAPE
ENVIRONMENTAL

PROJECT TITLE:
Annual NOx PSD Increment, Meteorological Year 2003



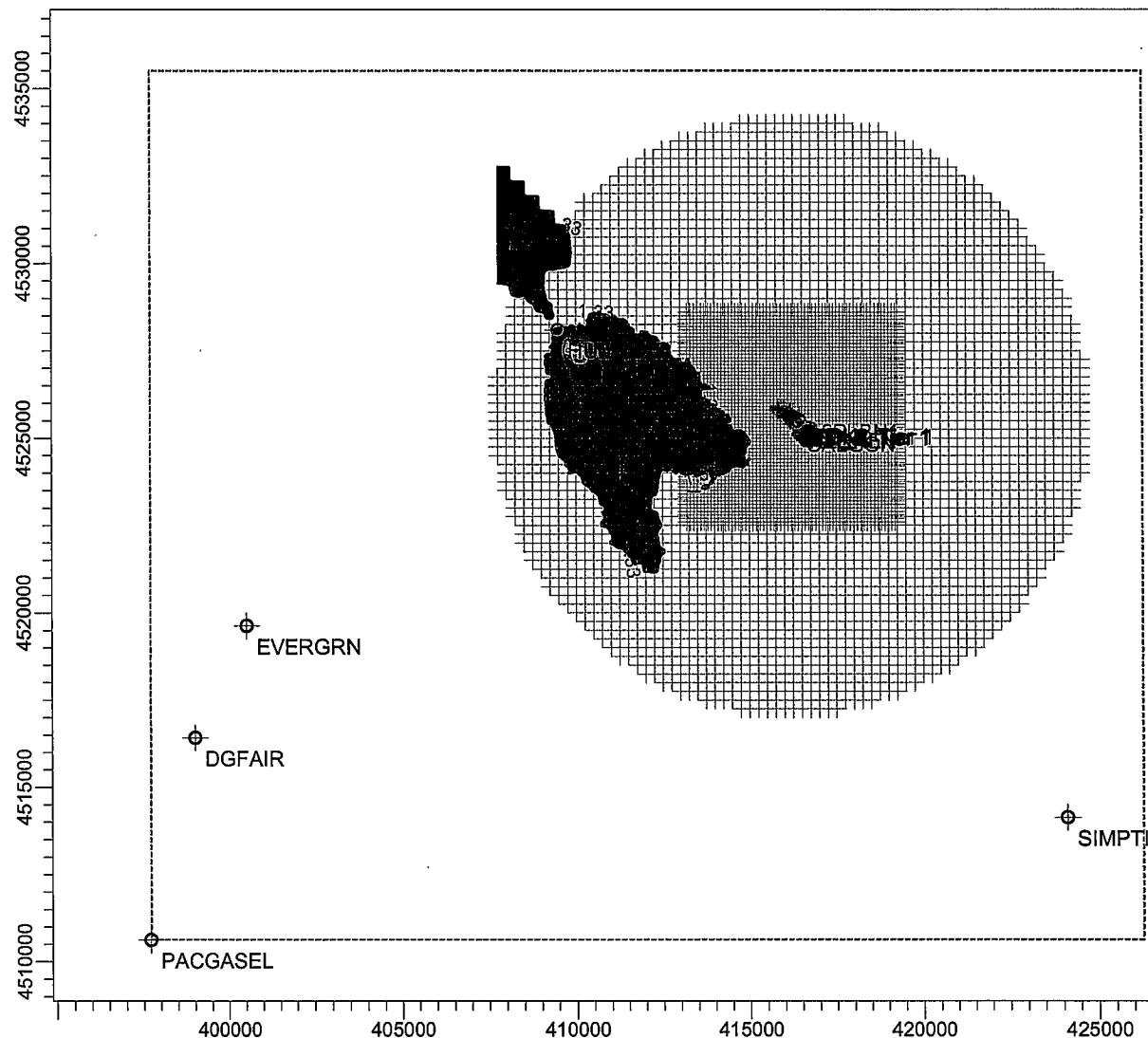
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



| | | |
|--|---|--|
| COMMENTS: Maximum Impact: 409750 E; 4527500 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 6817 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:193,615 0 5 km |
| | MAX: 27.25255 ug/m³ | DATE: 2/8/2006 |
| PROJECT NO.: | |  BLUESCAPE ENVIRONMENTAL |

PROJECT TITLE:
Annual NOx PSD Increment, Meteorological Year 2004



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: SRCGP1

ug/m³

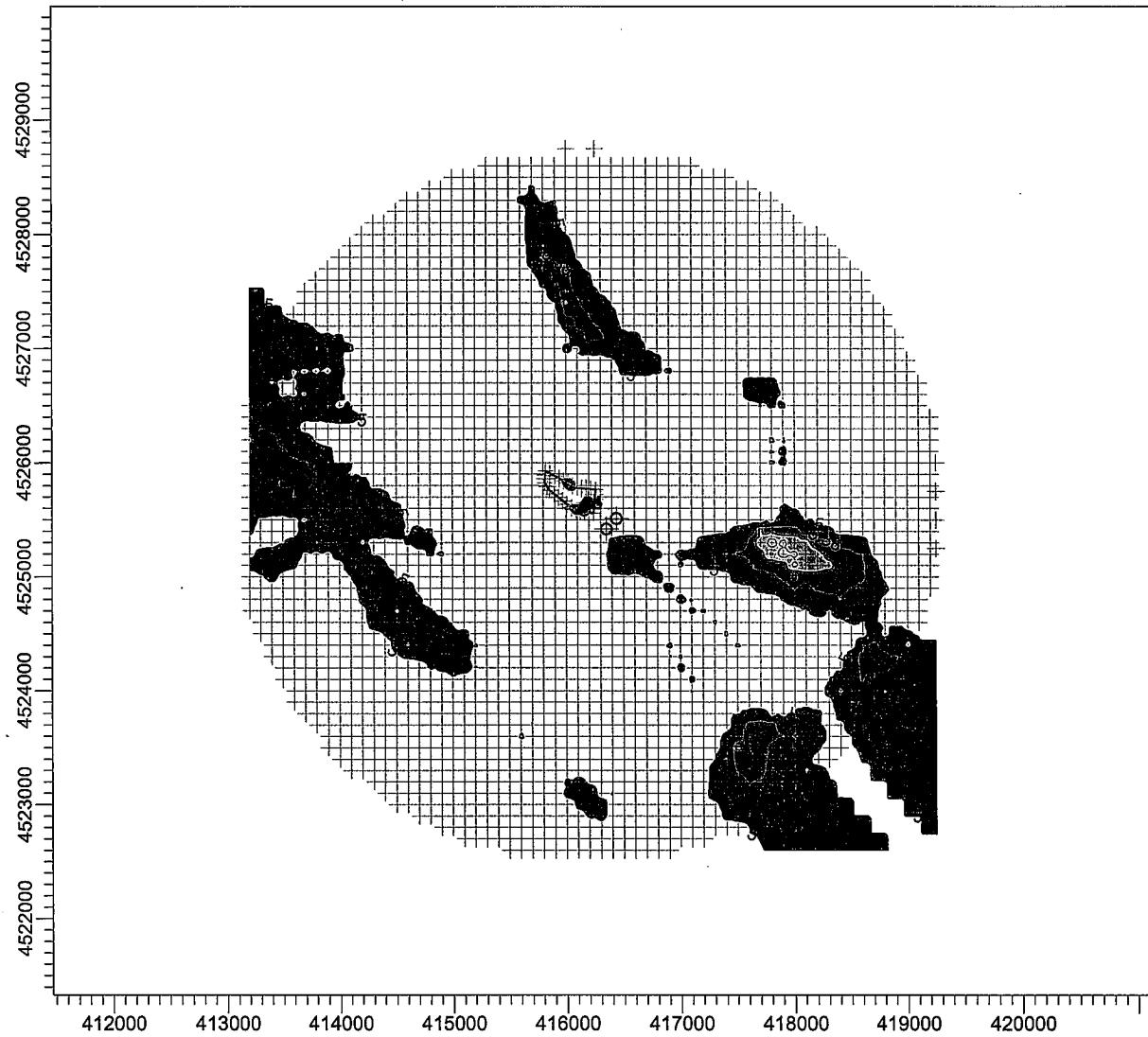


| | | |
|--|---|--|
| COMMENTS: Maximum Impact: 409750 E; 4527500 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 6817 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:193,615 0 5 km |
| | MAX: 28.05679 ug/m ³ | DATE: 2/8/2006 |
| | PROJECT NO.: | |



BLUESCAPE
ENVIRONMENTAL

PROJECT TITLE:
24-Hour PM10 PSD Increment, Meteorological Year 2000 - 2004



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m³

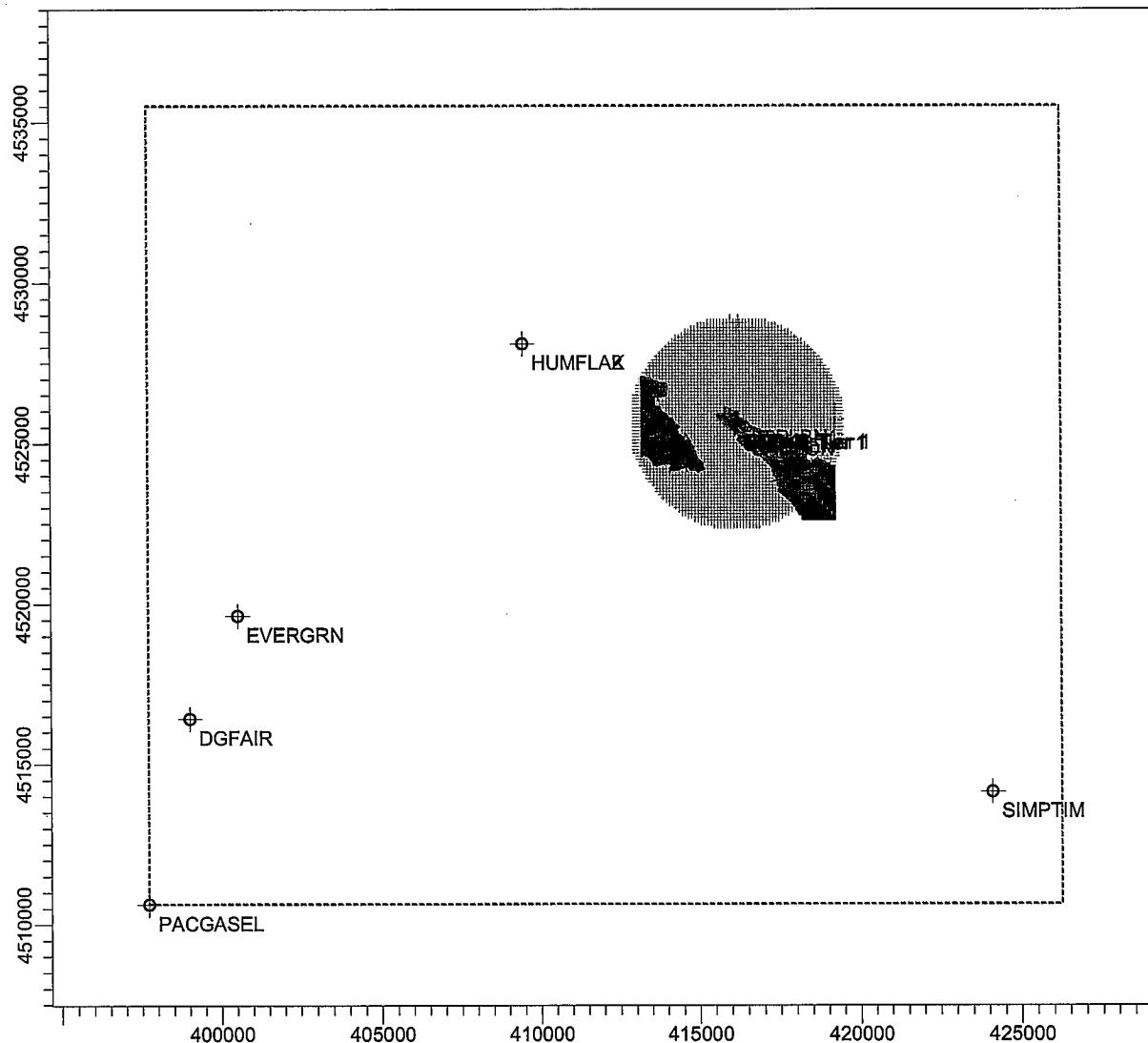


| | | |
|---|------------------------------------|--|
| COMMENTS: Maximum Impact: 417800 E; 4525300 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 3071 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:59,120 0 2 km |
| | MAX: 10.41182 ug/m ³ | DATE: 2/8/2006 |
| | | PROJECT NO.: |

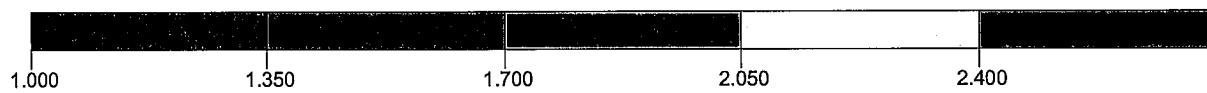


BLUESCAPE
ENVIRONMENTAL

PROJECT TITLE:
Annual PM10 PSD Increment, Meteorological Year 2000

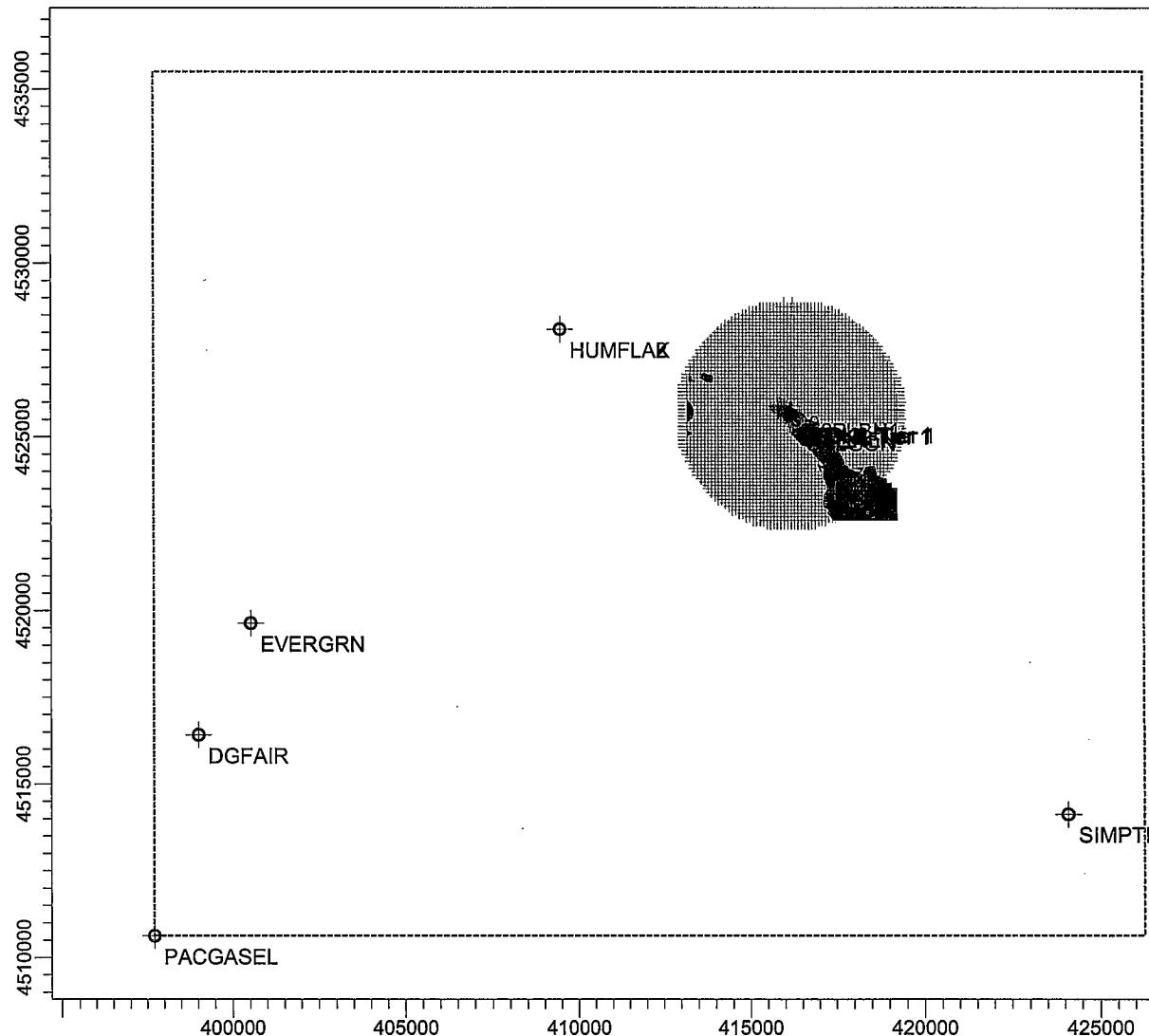


PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL ug/m³



| | | | |
|---|---|---|--|
| COMMENTS: Maximum Impact: 416500 E; 4525300 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |  BLUESCAPE ENVIRONMENTAL |
| | RECEPTORS: 3071 | MODELER: Gretchen Jüttner | |
| | OUTPUT TYPE: CONC | SCALE: 0 5 km | |
| | MAX: 2.38867 ug/m³ | DATE: 2/8/2006 | |
| | | | PROJECT NO.: |

PROJECT TITLE:
Annual PM10 PSD Increment, Meteorological Year 2001



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³

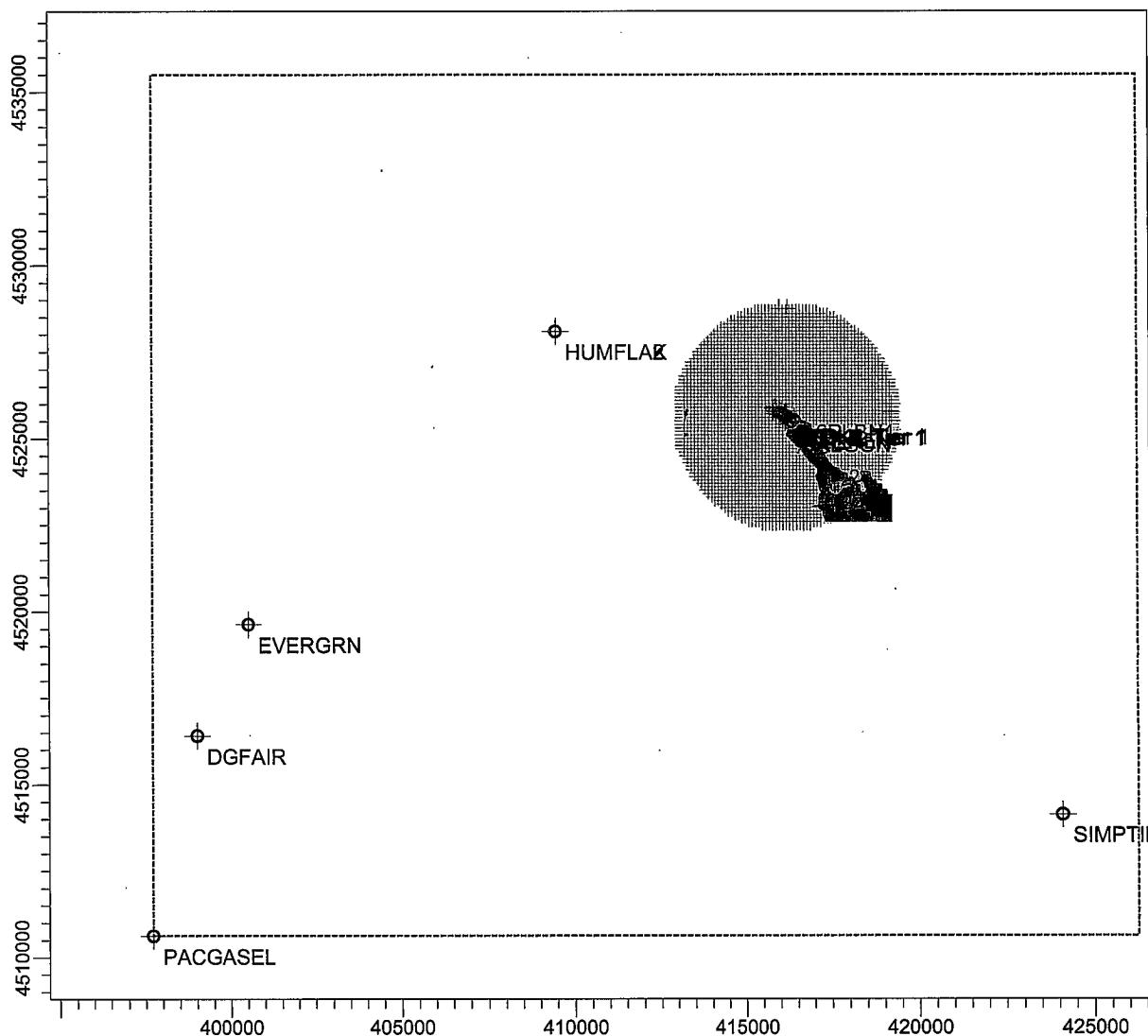


| | | |
|--|---|--|
| COMMENTS: Maximum Impact: 416500 E; 4525300 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 3071 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:194,639 0 5 km |
| | MAX: 2.1938 ug/m ³ | DATE: 2/8/2006 |
| | PROJECT NO.: | |



BLUESCAPE
ENVIRONMENTAL

PROJECT TITLE:
Annual PM10 PSD Increment, Meteorological Year 2002



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL ug/m³

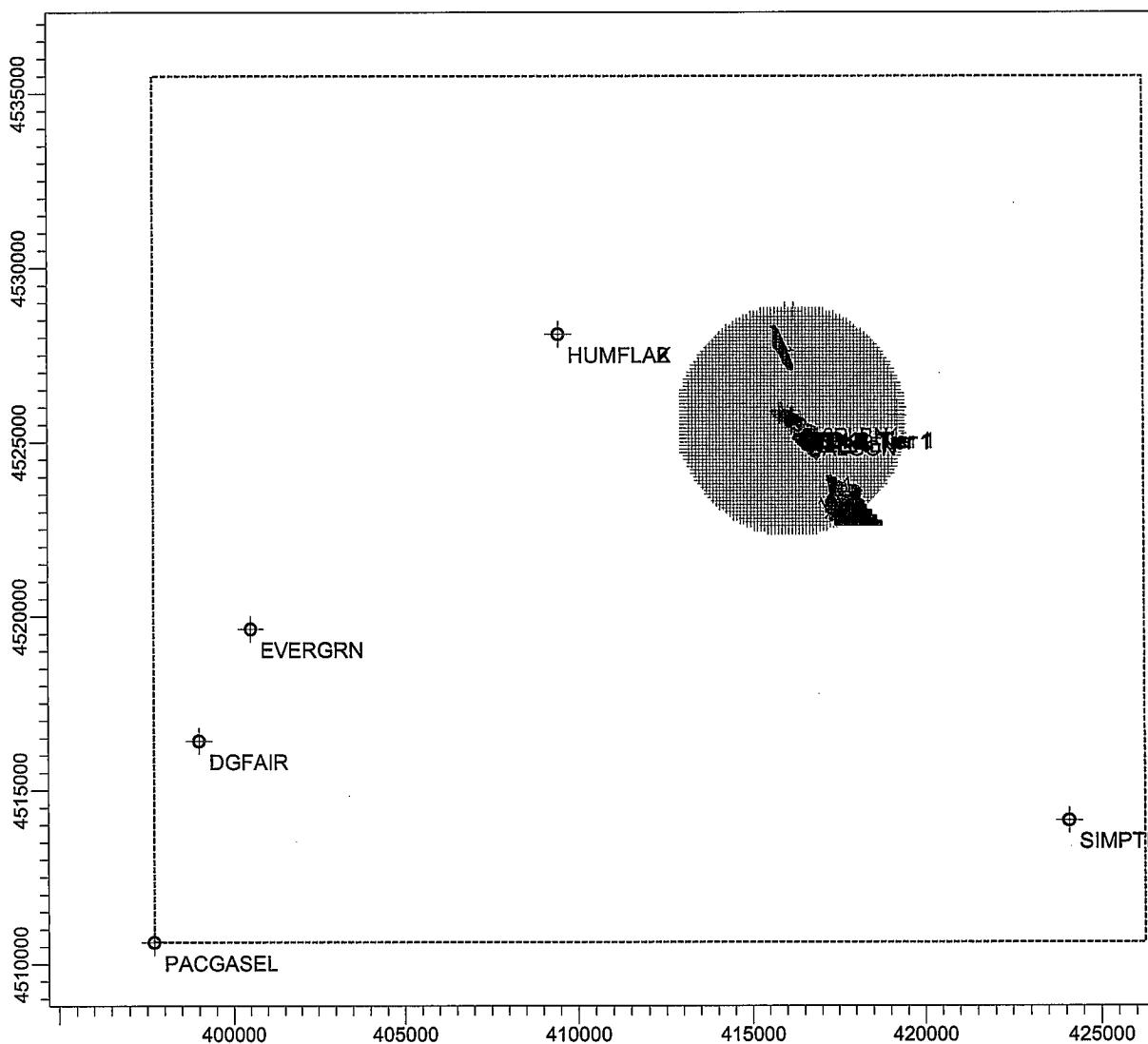


| | | |
|--|--|--|
| COMMENTS: Maximum Impact: 416500 E; 4525200 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 3071 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:194,639 0 5 km |
| | MAX: 1.86024 ug/m ³ | DATE: 2/8/2006 |
| | | PROJECT NO.: |



BLUESCAPE
ENVIRONMENTAL

PROJECT TITLE:
Annual PM10 PSD Increment, Meteorological Year 2003



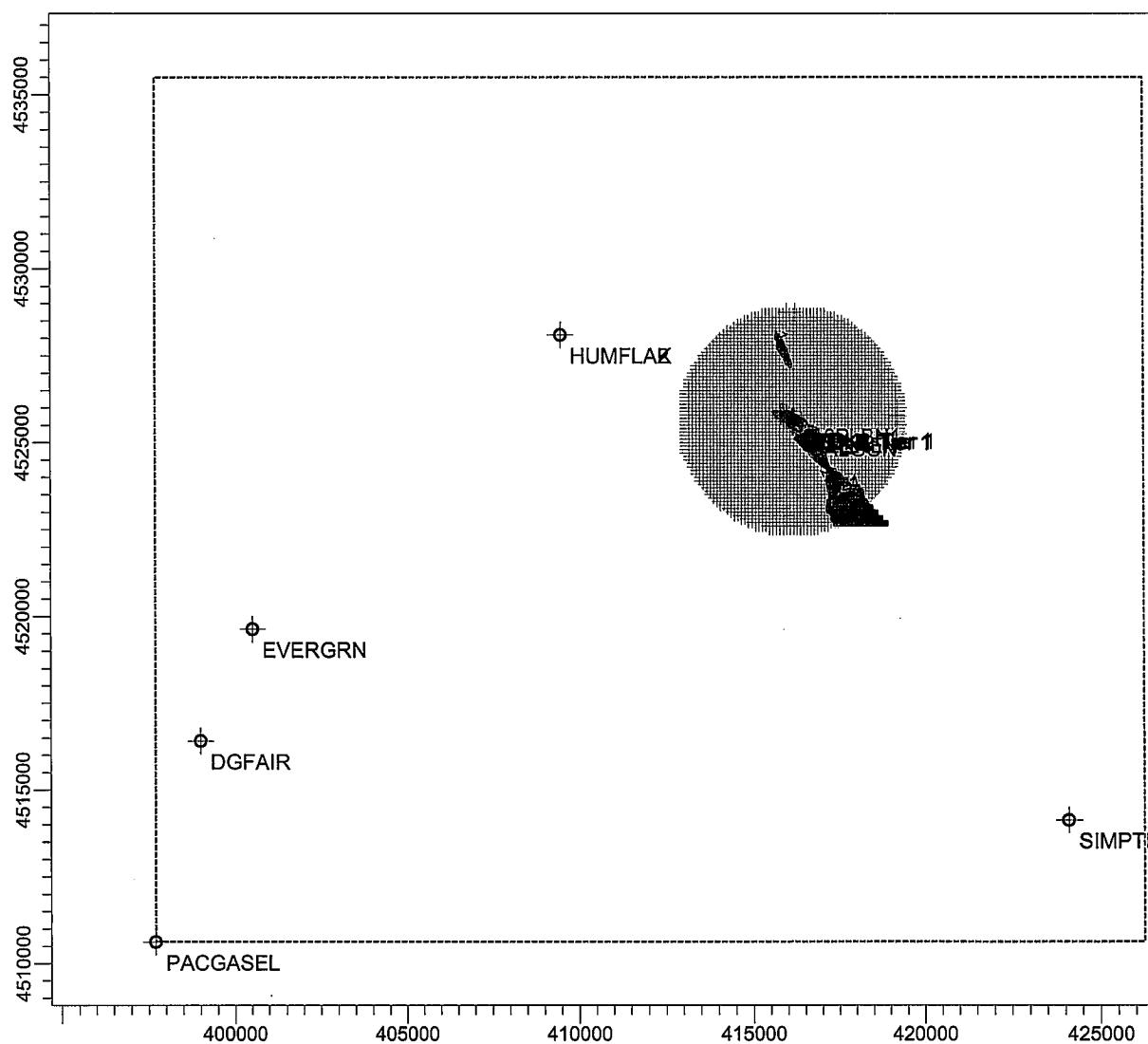
PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



| | | |
|---|-----------------------------------|--|
| COMMENTS: Maximum Impact: 416500 E; 4525200 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 3071 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:194,639 0 5 km |
| | MAX: 1.72328 ug/m ³ | DATE: 2/8/2006 |
| | | PROJECT NO.: |

PROJECT TITLE:
Annual PM10 PSD Increment, Meteorological Year 2004



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m³



| | | |
|--|--|--|
| COMMENTS: Maximum Impact: 416500 E; 4525200 N | SOURCES: 12 | COMPANY NAME: BlueScape Environmental |
| | RECEPTORS: 3071 | MODELER: Gretchen Jüttner |
| | OUTPUT TYPE: CONC | SCALE: 1:194,639 0 5 km |
| | MAX: 1.8471 ug/m³ | DATE: 2/8/2006 |
| | |  BLUESCAPE ENVIRONMENTAL |

NORTH COAST UNIFIED AIR QUALITY MANAGEMENT DISTRICT
2300 Myrtle Avenue, Eureka, CA 95501
Phone: (707) 443-3093 · Fax: (707) 443-3099



Wednesday, February 01, 2006

Tom Berge
BlueScape Environmental
9939 Hibert Street, Suite 105
San Diego, CA 92131

RE: Public Records Request Dated December 21, 2005

Dear Mr. Berge:

The purpose of this correspondence is to provide your office with the remainder of the information requested in the Public Records Request, dated December 21, 2005, regarding emissions and modeling data.

Much of the requested data is unavailable, or of questionable quality. At this time, the AQMD recommends performing the modeling exercise using the emissions data enclosed with this letter. This data is from 2002 and 2003. Model the emissions for each source itemized in this letter assuming only one stack per facility, and using an effective stack height of 350 feet.

While the AQMD understands that the results of the modeling analysis may not be accurate, it is the hope that the results will provide an extremely conservative estimate of PSD increment consumption.

An invoice for the time spent researching this project will be sent separately.

The AQMD does not endorse the emissions data provided and has doubts as to their accuracy. The instructions provided herein are not intended to set policy or precedent for future modeling projects. In the future, the AQMD may require further modeling as more accurate data become available.

Please do not hesitate to contact my office for further questions.

Sincerely,

Simona Altman
AQMD, Permit Division Manager

Cc: Mr. Daniel D. Yueh
Vice President
North American Power Group, Ltd.
8480 East Orchard Road, Ste 4000
Greenwood Village, CO 80111

Evergreen Pulp, Inc. (formerly Stockton Pacific Enterprises, formerly Samoa Pacific Cellulose)

One TCF Drive
Samoa, CA 95564

2003 Emissions Inventory (tons/year)

CO: 65.3

NOX: 307.9

PM10: 66.2

2002 Emissions Inventory (tons/year)

CO: 69.1

NOX: 351.1

PM10: 93.3

Operating Schedule: 24 hours/day, 7 days/week

DG Fairhaven Power (formerly Fairhaven Power Company)

97 Bay Street
Samoa, CA 95564

2003 Emissions Inventory (tons/year)

CO: 2424.9

NOX: 280.2

PM10: 109.4

2002 Emissions Inventory (tons/year)

CO: 2720.6

NOX: 300.8

PM10: 122.9

Operating Schedule: 24 hours/day, 7 days/week

Humboldt Flakeboard Panels

4700 West End Road
Arcata, CA 95521

2003 Emissions Inventory (tons/year)

CO: 79.6

NOX: 139.7

PM10: 56.3

2002 Emissions Inventory (tons/year)

CO: 89.1

NOX: 156

PM10: 63.6

Operating Schedule: 24 hours/day, 5 days/week, 52 weeks/year

Pacific Gas & Electric Company

Humboldt Bay Power Plant

1000 King Salmon Ave.
Eureka, CA 95503

2003 Emissions Inventory (tons/year)

CO: 64.5

NOX: 434.9

PM10: 18.4

2002 Emissions Inventory (tons/year)

CO: 95.3

NOX: 591.6

PM10: 21.4

Operating Schedule: 24 hours/day, 7 days/week

Simpson Timber Company

Korbel Mill

1165 Middlecreek Road

Korbel, CA 95550

2003 Emissions Inventory (tons/year)

CO: 107.9

NOX: 21.6

PM10: 40.3

2002 Emissions Inventory (tons/year)

CO: 157.6

NOX: 31.5

PM10: 66.9

Operating Schedule: 10 hours/day, 7 days/week

Calgon Carbon

501 Hatchery Road

Blue Lake, CA 95525

2003 Emissions Inventory (tons/year)

CO: 0

NOX: 0

PM10: 0.5

2002 Emissions Inventory (tons/year)

CO: 0

NOX: 0

PM10: 0.9

Operating Schedule: 24 hours/day, 7 days/week

Kernen Construction (formerly Walton Paving)

1195 Hatchery Rd.

Blue Lake, CA 95525

2003 Emissions Inventory (tons/year)

CO: 0

NOX: 0.1

PM10: 0.1

2002 Emissions Inventory (tons/year)

CO: 0.1

NOX: 0.2

PM10: 0.2

Operating Schedule: 20 hrs/day, 225 days/year



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SCSC ID: Equal To: 0602300012

Results are based on data extracted on JAN-20-2006

Note: Click on the underlined CORPORATE LINK value for links to that company's environmental web pages.

Click on the underlined MAPPING INFO value to obtain mapping information for the facility.

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| | | | |
|------------------------------|--|---------------------------|----------------------------|
| Facility Information: | View Facility Information | PLANT NAME: | FAIRHAVEN POWER COMPANY |
| STREET ADDRESS: | 97 BAY STREET | CITY NAME: | SAMOA |
| COUNTY: | HUMBOLDT | STATE: | CA |
| ZIP CODE: | 955640000 | COMPLIANCE STATUS: | IN COMPLIANCE - INSPECTION |
| LATITUDE: | 404759 | AFS PLANT ID: | NCU09612 |
| LONGITUDE: | 1241207 | CDS PLANT ID: | 00012 |
| INVENTORY YEAR: | 90 | EMERGENCY CONTROL: | Unknown status (default) |
| PRINCIPAL PRODUCT: | | MAPPING INFO: | MAP |
| CORPORATE LINK: | No | | |
| CLASS CODE: | ACTUAL OR POTENTIAL EMISSIONS ARE ABOVE THE APPLICABLE MAJOR SOURCE THRESHOLD. | | |

No pollutant codes are available for the above listed facility.

AIRS/AFS Plant Stack Data

| | | | |
|-----------------------------|--------|------------------------------------|-------|
| STACK NUMBER: | 1 | STACK DESC: | 1 |
| STACK HEIGHT: | 0105 | STACK DIAMETER: | 07.00 |
| PLUME HEIGHT: | | STACK EXIT GAS TEMPERATURE: | 336 |
| STACK GAS FLOW RATE: | 126790 | STACK EXIT GAS VELOCITY: | 54 |

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

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SCSC ID: Equal To: 0602300529

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| | | | |
|------------------------------|--|---------------------------|----------------------------|
| Facility Information: | View Facility Information | PLANT NAME: | HUMBOLDT BAY POWER PLANT |
| STREET ADDRESS: | 1000 KING SALMON AVENUE | CITY NAME: | EUREKA |
| COUNTY: | HUMBOLDT | STATE: | CA |
| ZIP CODE: | 95503 | COMPLIANCE STATUS: | IN COMPLIANCE - INSPECTION |
| LATITUDE: | 404424 | AFS PLANT ID: | NCU05912 |
| LONGITUDE: | 1241242 | CDS PLANT ID: | 00529 |
| INVENTORY YEAR: | 90 | EMERGENCY CONTROL: | Unknown status (default) |
| PRINCIPAL PRODUCT: | | MAPPING INFO: | MAP |
| CORPORATE LINK: | No | | |
| CLASS CODE: | ACTUAL OR POTENTIAL EMISS ARE ABOVE THE APPLICABLE MAJOR SOURCE THRESHOLD. | | |

No pollutant codes are available for the above listed facility.

AIRS/AFS Plant Stack Data

| | | | |
|-----------------------------|--------|------------------------------------|-------|
| <u>STACK NUMBER:</u> | 1 | <u>STACK DESC:</u> | 1 |
| <u>STACK HEIGHT:</u> | 0120 | <u>STACK DIAMETER:</u> | 10.00 |
| <u>PLUME HEIGHT:</u> | | <u>STACK EXIT GAS TEMPERATURE:</u> | 321 |
| <u>STACK GAS FLOW RATE:</u> | 208500 | <u>STACK EXIT GAS VELOCITY:</u> | 44.3 |

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

| | | | |
|-----------------------------|--------|------------------------------------|-------|
| <u>STACK NUMBER:</u> | 2 | <u>STACK DESC:</u> | 2 |
| <u>STACK HEIGHT:</u> | 0120 | <u>STACK DIAMETER:</u> | 10.00 |
| <u>PLUME HEIGHT:</u> | | <u>STACK EXIT GAS TEMPERATURE:</u> | 321 |
| <u>STACK GAS FLOW RATE:</u> | 208500 | <u>STACK EXIT GAS VELOCITY:</u> | 44.3 |

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

| | | | |
|-----------------------------|--------|------------------------------------|-------|
| <u>STACK NUMBER:</u> | 3 | <u>STACK DESC:</u> | 3 |
| <u>STACK HEIGHT:</u> | 0010 | <u>STACK DIAMETER:</u> | 08.00 |
| <u>PLUME HEIGHT:</u> | | <u>STACK EXIT GAS TEMPERATURE:</u> | 791 |
| <u>STACK GAS FLOW RATE:</u> | 187000 | <u>STACK EXIT GAS VELOCITY:</u> | 62 |

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

| | | | |
|----------------------|---|--------------------|---|
| <u>STACK NUMBER:</u> | 4 | <u>STACK DESC:</u> | 4 |
|----------------------|---|--------------------|---|

STACK HEIGHT: 0010 STACK DIAMETER: 08.00
PLUME HEIGHT: STACK EXIT GAS TEMPERATURE: 791
STACK GAS FLOW RATE: 187000 STACK EXIT GAS VELOCITY: 62

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

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SCSC ID: Equal To: 0602300405

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| | | | |
|------------------------------|---|---------------------------|---|
| Facility Information: | View Facility Information | PLANT NAME: | HUMBOLDT FLAKEBOARD PANELS INCORPORATED |
| STREET ADDRESS: | 4700 WEST END ROAD | CITY NAME: | ARCATA |
| COUNTY: | HUMBOLDT | STATE: | CA |
| ZIP CODE: | 95521 | COMPLIANCE STATUS: | IN COMPLIANCE - INSPECTION |
| LATITUDE: | 405149 | AFS PLANT ID: | NCU04712 |
| LONGITUDE: | 1240530 | CDS PLANT ID: | 00405 |
| INVENTORY YEAR: | 90 | EMERGENCY CONTROL: | Unknown status (default) |
| PRINCIPAL PRODUCT: | | MAPPING INFO: | MAP |
| CORPORATE LINK: | No | | |

ACTUAL OR
POTENTIAL EMISS
ARE ABOVE THE
APPLICABLE MAJOR
SOURCE
THRESHOLD.

No pollutant codes are available for the above listed facility.

AIRS/AFS Plant Stack Data

STACK NUMBER: 1 STACK DESC: 1
STACK HEIGHT: 0040 STACK DIAMETER: 02.70
PLUME HEIGHT: STACK EXIT GAS TEMPERATURE: 491
STACK GAS FLOW RATE: 8550 STACK EXIT GAS VELOCITY: 24.9

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

STACK NUMBER: 2 STACK DESC: 3
STACK HEIGHT: 0050 STACK DIAMETER: 03.70
PLUME HEIGHT: STACK EXIT GAS TEMPERATURE: 151
STACK GAS FLOW RATE: 55994 STACK EXIT GAS VELOCITY: 88.3

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

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SCSC ID: Equal To: 0602300001

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| | | | |
|------------------------------|--|---------------------------|-----------------------------|
| Facility Information: | View Facility Information | PLANT NAME: | SAMOA PACIFIC CELLULOSE LLC |
| STREET ADDRESS: | 1 TCF DRIVE | CITY NAME: | SAMOA |
| COUNTY: | HUMBOLDT | STATE: | CA |
| ZIP CODE: | 95564 | COMPLIANCE STATUS: | IN COMPLIANCE - INSPECTION |
| LATITUDE: | 404848 | AFS PLANT ID: | NCU03712 |
| LONGITUDE: | 1241108 | CDS PLANT ID: | 00001 |
| INVENTORY YEAR: | 90 | EMERGENCY CONTROL: | Unknown status (default) |
| PRINCIPAL PRODUCT: | | MAPPING INFO: | MAP |
| CORPORATE LINK: | No | | |
| CLASS CODE: | ACTUAL OR POTENTIAL EMISSIONS ARE ABOVE THE APPLICABLE MAJOR SOURCE THRESHOLD. | | |

No pollutant codes are available for the above listed facility.

AIRS/AFS Plant Stack Data

| | | | |
|-----------------------------|--------|------------------------------------|-------|
| <u>STACK NUMBER:</u> | 1 | <u>STACK DESC:</u> | 1 |
| <u>STACK HEIGHT:</u> | 0076 | <u>STACK DIAMETER:</u> | 07.50 |
| <u>PLUME HEIGHT:</u> | | <u>STACK EXIT GAS TEMPERATURE:</u> | 142 |
| <u>STACK GAS FLOW RATE:</u> | 114000 | <u>STACK EXIT GAS VELOCITY:</u> | 43 |

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

| | | | |
|-----------------------------|-------|------------------------------------|-------|
| <u>STACK NUMBER:</u> | 2 | <u>STACK DESC:</u> | 2 |
| <u>STACK HEIGHT:</u> | 0060 | <u>STACK DIAMETER:</u> | 06.50 |
| <u>PLUME HEIGHT:</u> | | <u>STACK EXIT GAS TEMPERATURE:</u> | 141 |
| <u>STACK GAS FLOW RATE:</u> | 92000 | <u>STACK EXIT GAS VELOCITY:</u> | 46 |

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

| | | | |
|-----------------------------|--------|------------------------------------|-------|
| <u>STACK NUMBER:</u> | 3 | <u>STACK DESC:</u> | 3 |
| <u>STACK HEIGHT:</u> | 0060 | <u>STACK DIAMETER:</u> | 06.40 |
| <u>PLUME HEIGHT:</u> | | <u>STACK EXIT GAS TEMPERATURE:</u> | 156 |
| <u>STACK GAS FLOW RATE:</u> | 108000 | <u>STACK EXIT GAS VELOCITY:</u> | 56 |

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

| | | | |
|----------------------|---|--------------------|---|
| <u>STACK NUMBER:</u> | 4 | <u>STACK DESC:</u> | 4 |
|----------------------|---|--------------------|---|

STACK HEIGHT: 0082 STACK DIAMETER: 05.00
PLUME HEIGHT: STACK EXIT GAS TEMPERATURE: 169
STACK GAS FLOW RATE: 35500 STACK EXIT GAS VELOCITY: 31.3

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

STACK NUMBER: 5 STACK DESC: 5
STACK HEIGHT: 0297 STACK DIAMETER: 11.00
PLUME HEIGHT: STACK EXIT GAS TEMPERATURE: 172
STACK GAS FLOW RATE: 328397 STACK EXIT GAS VELOCITY: 57.6

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

STACK NUMBER: 6 STACK DESC: 7
STACK HEIGHT: 0129 STACK DIAMETER: 03.80
PLUME HEIGHT: STACK EXIT GAS TEMPERATURE: 172
STACK GAS FLOW RATE: 11350 STACK EXIT GAS VELOCITY: 16

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

STACK NUMBER: 7 STACK DESC: 8
STACK HEIGHT: 0129 STACK DIAMETER: 03.80
PLUME HEIGHT: STACK EXIT GAS TEMPERATURE: 172
STACK GAS FLOW RATE: 12600 STACK EXIT GAS VELOCITY: 18

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

STACK NUMBER: 8 **STACK DESC:** 10
STACK HEIGHT: 0297 **STACK DIAMETER:** 11.00
PLUME HEIGHT: **STACK EXIT GAS TEMPERATURE:** 350
STACK GAS FLOW RATE: 190000 **STACK EXIT GAS VELOCITY:** 58

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

STACK NUMBER: 9 **STACK DESC:** 11
STACK HEIGHT: 0200 **STACK DIAMETER:** 04.20
PLUME HEIGHT: **STACK EXIT GAS TEMPERATURE:** 180
STACK GAS FLOW RATE: 14670 **STACK EXIT GAS VELOCITY:** 17.9

List of Pollutant Information

Note: There is no Pollutant Information available for this Stack.

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APPENDIX D
Class I Modeling

APPENDIX D.1
VISCREEN Model Results

Visual Effects Screening Analysis for
Source: Ultrapower 3
Class I Area: Redwood National Park

*** Level-1 Screening ***
Input Emissions for

| | | |
|--------------|--------|--------|
| Particulates | 34.89 | TON/YR |
| NOx (as NO2) | 138.60 | TON/YR |
| Primary NO2 | .00 | TON/YR |
| Soot | .00 | TON/YR |
| Primary SO4 | .00 | TON/YR |

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

| | | |
|-------------------------------|--------|---------|
| Background Ozone: | .04 | ppm |
| Background Visual Range: | 230.00 | km |
| Source-Observer Distance: | 22.00 | km |
| Min. Source-Class I Distance: | 22.00 | km |
| Max. Source-Class I Distance: | 98.00 | km |
| Plume-Source-Observer Angle: | 11.25 | degrees |
| Stability: | 6 | |
| Wind Speed: | 1.00 | m/s |

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE Exceeded

| Backgrnd | Theta | Azi | Distance | Alpha | Delta E | | Contrast | |
|----------|-------|------|----------|-------|---------|--------|----------|-------|
| | | | | | Crit | Plume | Crit | Plume |
| SKY | 10. | 155. | 39.1 | 14. | 2.00 | 2.696* | .05 | .043 |
| SKY | 140. | 155. | 39.1 | 14. | 2.00 | 1.248 | .05 | -.023 |
| TERRAIN | 10. | 84. | 22.0 | 84. | 2.00 | 4.084* | .05 | .022 |
| TERRAIN | 140. | 84. | 22.0 | 84. | 2.00 | .203 | .05 | .002 |

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE Exceeded

| Backgrnd | Theta | Azi | Distance | Alpha | Delta E | | Contrast | |
|----------|-------|-----|----------|-------|---------|---------|----------|--------|
| | | | | | Crit | Plume | Crit | Plume |
| SKY | 10. | 1. | 1.0 | 168. | 2.00 | 12.988* | .05 | .272* |
| SKY | 140. | 1. | 1.0 | 168. | 2.00 | 3.184* | .05 | -.096* |
| TERRAIN | 10. | 1. | 1.0 | 168. | 2.00 | 24.752* | .05 | .237* |
| TERRAIN | 140. | 1. | 1.0 | 168. | 2.00 | 3.166* | .05 | .051* |

APPENDIX D.2
ISCST3 Model Results

```

**
*****
**
** ISCST3 Input Produced by:
** ISC-AERMOD View Ver. 5.1
** Lakes Environmental Software Inc.
** Date: 2/7/2006
** File: C:\PROJECTS2005\BLUELAKE\ISC\BLNOSI00\CL1XQ01.INP
**
*****
**
**
*****  

** ISCST3 Control Pathway
*****  

**
**
CO STARTING
TITLEONE Blue Lake Class I X/Q Modeling
TITLETWO CL1XQ01
MODELOPT DFAULT CONC RURAL
AVERTIME ANNUAL
POLLUTID OTHER
TERRHGT ELEV
RUNORNOT RUN
CO FINISHED
**
*****
** ISCST3 Source Pathway
*****
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
LOCATION ESP POINT 416173.000 4525622.000 24.380
** DESCRSRC ESP Exhaust for Wood Burner
** Source Parameters **
SRCPARAM ESP 1 30.480 388.700 15.65000 1.520

** Building Downwash **
BUILDHGT ESP      15.10    15.10    15.10    15.10    15.10    15.10
BUILDHGT ESP      14.20    14.20    14.20    14.20    13.10    13.10
BUILDHGT ESP      13.10    13.10    13.10    15.10    14.20    14.20
BUILDHGT ESP      15.10    15.10    15.10    15.10    15.10    15.10
BUILDHGT ESP      14.20    14.20    14.20    14.20    13.10    13.10
BUILDHGT ESP      13.10    13.10    13.10    15.10    14.20    14.20

BUILDWID ESP      18.03    16.64    22.75    37.46    41.89    45.06
BUILDWID ESP      21.23    18.97    16.13    17.90    56.09    53.15
BUILDWID ESP      48.60    42.57    35.25    19.16    36.07    36.83
BUILDWID ESP      18.03    16.64    22.75    37.46    41.89    45.06
BUILDWID ESP      21.23    18.97    16.13    17.90    56.09    53.15
BUILDWID ESP      48.60    42.57    35.25    19.16    36.07    36.83

SRCGROUP ALL

```

SO FINISHED
**

** ISCST3 Receptor Pathway

**
**
RE STARTING
** DESCRREC "UCART1" "Receptors generated from Uniform Cartesian Grid"
DISCCART 219206.00 4548238.00 111.00
RE FINISHED
**

** ISCST3 Meteorology Pathway

**
**
ME STARTING
INPUTFIL BLAKE00.ASC
ANEMHGHT 10 METERS
SURFDATA 25945 2000
UAIRDATA 23230 2000 OAKLAND/WSO_AP
ME FINISHED
**

** ISCST3 Output Pathway

**
**
OU STARTING
** Auto-Generated Plotfiles
PLOTFILE ANNUAL ALL CL1XQ01.IS\ANOOGALL.PLT
OU FINISHED

*** SETUP Finishes Successfully ***

*** ISCST3 - VERSION 02035 *** *** Blue Lake Class I X/Q Modeling
*** 02/07/06 *** CL1XQ01

*** 17:53:46

**MODELOPTs:

PAGE 1

CONC RURAL ELEV DFAULT

*** MODEL SETUP OPTIONS SUMMARY

-- SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION. DDPLETE = F
**Model Uses NO WET DEPLETION. WDPLETE = F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:

1. Final Plume Rise.
2. Stack-tip Downwash.
3. Buoyancy-induced Dispersion.
4. Use Calms Processing Routine.
5. Not Use Missing Data Processing Routine.
6. Default Wind Profile Exponents.
7. Default Vertical Potential Temperature Gradients.
8. "Upper Bound" Values for Supersquat Buildings.
9. No Exponential Decay for RURAL Mode

**Model Accepts Receptors on ELEV Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates ANNUAL Averages Only

**This Run Includes: 1 Source(s); 1 Source Group(s); and 1 Receptor(s)

**The Model Assumes A Pollutant Type of: OTHER

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor
Model Outputs External File(s) of High Values for Plotting (PLOTFILE
Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: . c for Calm Hours

Hours m for Missing
and Missing Hours b for Both Calm

**Misc. Inputs: Anem. Hgt. (m) = 10.00 ; Decay Coef. = 0.000 ;
Rot. Angle = 0.0 Emission Units = GRAMS/SEC ;
Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 1.2 MB of RAM.

**Input Runstream File: CL1XQ01.INP
**Output Print File: CL1XQ01.OUT

*** ISCST3 - VERSION 02035 ***
*** 02/07/06

*** Blue Lake Class I X/Q Modeling
*** CL1XQ01

*** 17:53:46

**MODELOPTs:

PAGE 2

CONC

RURAL ELEV

DFAULT

*** POINT SOURCE DATA ***

| STACK | NUMBER | EMISSION RATE | BASE | STACK | STACK |
|-----------|----------|------------------------|-------------|-----------|----------|
| SOURCE | STACK | BUILDING EMISSION RATE | ELEV. | HEIGHT | TEMP. |
| EXIT VEL. | PART. | (GRAMS/SEC) | X | Y | |
| ID | DIAMETER | EXISTS | SCALAR VARY | | |
| (M/SEC) | (METERS) | CATS. | (METERS) | (METERS) | (METERS) |
| | | BY | | | (DEG.K) |
| ESP | 0 | 0.10000E+01 | 416173.0 | 4525622.0 | 24.4 |
| 15.65 | 1.52 | YES | | | 30.48 |
| | | | | | 388.70 |

*** ISCST3 - VERSION 02035 *** *** Blue Lake Class I X/Q Modeling
*** 02/07/06 *** CL1XQ01
*** 17:53:46
**MODELOPTs:
PAGE 3 RURAL ELEV DFAULT
CONC

*** SOURCE IDs DEFINING SOURCE GROUPS

| GROUP ID | SOURCE IDs |
|----------|------------|
| ALL | ESP |

*** ISCST3 - VERSION 02035 ***
*** 02/07/06

*** Blue Lake Class I X/Q Modeling
*** CL1XQ01

*** 17:53:46

**MODELOPTs:

PAGE 4

CONC

RURAL ELEV

DFAULT

*** DIRECTION SPECIFIC BUILDING
DIMENSIONS ***

SOURCE ID: ESP

| | IFV | BH | BW | WAK | IFV | BH | BW | WAK | IFV | BH | BW | WAK | IFV | BH |
|-------|-------|-------|-------|-------|-----|-------|-------|-------|-----|-------|-------|-----|-----|-------|
| | BW | WAK | IFV | BH | BW | WAK | IFV | BH | BW | WAK | BW | WAK | IFV | BH |
| 1 | 15.1, | 18.0, | 0 | | 2 | 15.1, | 16.6, | 0 | 3 | 15.1, | 22.8, | 0 | 4 | 15.1, |
| 37.5, | 0 | 5 | 15.1, | 41.9, | 0 | 6 | 15.1, | 45.1, | 0 | | | | | |
| 7 | 14.2, | 21.2, | 0 | | 8 | 14.2, | 19.0, | 0 | 9 | 14.2, | 16.1, | 0 | 10 | 14.2, |
| 17.9, | 0 | 11 | 13.1, | 56.1, | 0 | 12 | 13.1, | 53.2, | 0 | | | | | |
| 13 | 13.1, | 48.6, | 0 | | 14 | 13.1, | 42.6, | 0 | 15 | 13.1, | 35.3, | 0 | 16 | 15.1, |
| 19.2, | 0 | 17 | 14.2, | 36.1, | 0 | 18 | 14.2, | 36.8, | 0 | | | | | |
| 19 | 15.1, | 18.0, | 0 | | 20 | 15.1, | 16.6, | 0 | 21 | 15.1, | 22.8, | 0 | 22 | 15.1, |
| 37.5, | 0 | 23 | 15.1, | 41.9, | 0 | 24 | 15.1, | 45.1, | 0 | | | | | |
| 25 | 14.2, | 21.2, | 0 | | 26 | 14.2, | 19.0, | 0 | 27 | 14.2, | 16.1, | 0 | 28 | 14.2, |
| 17.9, | 0 | 29 | 13.1, | 56.1, | 0 | 30 | 13.1, | 53.2, | 0 | | | | | |
| 31 | 13.1, | 48.6, | 0 | | 32 | 13.1, | 42.6, | 0 | 33 | 13.1, | 35.3, | 0 | 34 | 15.1, |
| 19.2, | 0 | 35 | 14.2, | 36.1, | 0 | 36 | 14.2, | 36.8, | 0 | | | | | |

*** ISCST3 - VERSION 02035 ***
*** 02/07/06

*** Blue Lake Class I X/Q Modeling
*** CL1XQ01

*** 17:53:46

**MODELOPTs:

PAGE 5

CONC

RURAL ELEV

DEFAULT

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

(219206.0, 4548238.0, 111.0, 0.0);

| | | | | |
|------------|------------|------------|------------|------------|
| .35000E+00 | E | .35000E+00 | .35000E+00 | .35000E+00 |
| | .35000E+00 | .35000E+00 | .35000E+00 | |
| | F | .55000E+00 | .55000E+00 | .55000E+00 |
| .55000E+00 | .55000E+00 | .55000E+00 | | |

GRADIENTS ***

*** VERTICAL POTENTIAL TEMPERATURE

(DEGREES KELVIN PER METER)

| 5 | STABILITY CATEGORY | WIND SPEED CATEGORY | | | 4 |
|------------|-----------------------|---------------------|------------|------------|---|
| | | 1 | 2 | 3 | |
| 6 | A | .00000E+00 | .00000E+00 | .00000E+00 | |
| .00000E+00 | .00000E+00 | .00000E+00 | .00000E+00 | .00000E+00 | |
| .00000E+00 | B | .00000E+00 | .00000E+00 | .00000E+00 | |
| .00000E+00 | .00000E+00 | .00000E+00 | .00000E+00 | .00000E+00 | |
| .00000E+00 | C | .00000E+00 | .00000E+00 | .00000E+00 | |
| .00000E+00 | .00000E+00 | .00000E+00 | .00000E+00 | .00000E+00 | |
| .00000E+00 | D | .00000E+00 | .00000E+00 | .00000E+00 | |
| .00000E+00 | .00000E+00 | .00000E+00 | .00000E+00 | .00000E+00 | |
| .00000E+00 | E | .20000E-01 | .20000E-01 | .20000E-01 | |
| .20000E-01 | .20000E-01 | .20000E-01 | .20000E-01 | .20000E-01 | |
| .35000E-01 | F | .35000E-01 | .35000E-01 | .35000E-01 | |
| .35000E-01 | .35000E-01 | .35000E-01 | .35000E-01 | .35000E-01 | |

*** ISCST3 - VERSION 02035 ***
*** 02/07/06

*** Blue Lake Class I X/Q Modeling

*** CL1XQ01

*** 17:53:46

**MODELOPTs:

PAGE 7

CONC RURAL ELEV

DEFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: BLAKE00.ASC

FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)

SURFACE STATION NO.: 25945 UPPER AIR STATION NO.:

23230

NAME: UNKNOWN

NAME:

OAKLAND/WSO AP

YEAR: 2000

YEAR:

2000

| | | | | | | | | | | | |
|--------|----|------|----|-------|------|-------|---|--------|--------|--------|-----|
| 00 | 01 | 01 | 16 | 0.0 | 0.00 | 280.3 | 4 | 1042.0 | 1042.0 | 0.0000 | 0.0 |
| 0.0000 | 0 | 0.00 | | | | | | | | | |
| 00 | 01 | 01 | 17 | 0.0 | 0.00 | 278.5 | 5 | 1041.8 | 1031.6 | 0.0000 | 0.0 |
| 0.0000 | 0 | 0.00 | | | | | | | | | |
| 00 | 01 | 01 | 18 | 0.0 | 0.00 | 277.5 | 6 | 1040.5 | 945.4 | 0.0000 | 0.0 |
| 0.0000 | 0 | 0.00 | | | | | | | | | |
| 00 | 01 | 01 | 19 | 0.0 | 0.00 | 277.4 | 6 | 1039.2 | 859.2 | 0.0000 | 0.0 |
| 0.0000 | 0 | 0.00 | | | | | | | | | |
| 00 | 01 | 01 | 20 | 313.0 | 1.00 | 277.4 | 6 | 1037.9 | 772.9 | 0.0000 | 0.0 |
| 0.0000 | 0 | 0.00 | | | | | | | | | |
| 00 | 01 | 01 | 21 | 324.0 | 1.00 | 277.4 | 6 | 1036.5 | 686.7 | 0.0000 | 0.0 |
| 0.0000 | 0 | 0.00 | | | | | | | | | |
| 00 | 01 | 01 | 22 | 0.0 | 0.00 | 276.5 | 6 | 1035.2 | 600.5 | 0.0000 | 0.0 |
| 0.0000 | 0 | 0.00 | | | | | | | | | |
| 00 | 01 | 01 | 23 | 327.0 | 1.00 | 276.8 | 6 | 1033.9 | 514.2 | 0.0000 | 0.0 |
| 0.0000 | 0 | 0.00 | | | | | | | | | |
| 00 | 01 | 01 | 24 | 317.0 | 1.30 | 276.9 | 6 | 1032.6 | 428.0 | 0.0000 | 0.0 |
| 0.0000 | 0 | 0.00 | | | | | | | | | |

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCST3 - VERSION 02035 *** *** Blue Lake Class I X/Q Modeling
*** 02/07/06 *** CL 1V001

*** Blue Lake Class I X/Q Modeling

*** CL1XQ01

*** 17:53:46

**MODELOPTs:

PAGE 8

CONC

RURAL ELEV

DFAULT

DISCRETE CARTESIAN READER

—

** CONC. OF OTHER IN MICROGRAMS/M³

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) |
|-------------|-------------|-----------|-------------|
| Y-COORD (M) | CONC | | |
| - - - - - | - - - - - | - - - - - | - - - - - |
| 219206.00 | 4548238.00 | 0.00060 | |

*** ISCST3 - VERSION 02035 ***
*** 02/07/06

*** Blue Lake Class I X/Q Modeling
*** CL1X001

17:53:46

**MODELOPTs;

PAGE 9

CONC

RURAL ELEV

DEFAULT

** CONC OF OTHER IN MICROGRAMS/M**3

＊＊

| | | | | |
|---------|-----------------------|--------------|------------|-------------|
| ALL | 1ST HIGHEST VALUE IS | 0.00060 AT (| 219206.00, | 4548238.00, |
| 111.00, | 0.00) DC NA | | | |
| 0.00, | 2ND HIGHEST VALUE IS | 0.00000 AT (| 0.00, | 0.00, |
| 0.00, | 0.00) | | | |
| 0.00, | 3RD HIGHEST VALUE IS | 0.00000 AT (| 0.00, | 0.00, |
| 0.00, | 0.00) | | | |
| 0.00, | 4TH HIGHEST VALUE IS | 0.00000 AT (| 0.00, | 0.00, |
| 0.00, | 0.00) | | | |
| 0.00, | 5TH HIGHEST VALUE IS | 0.00000 AT (| 0.00, | 0.00, |
| 0.00, | 0.00) | | | |
| 0.00, | 6TH HIGHEST VALUE IS | 0.00000 AT (| 0.00, | 0.00, |
| 0.00, | 0.00) | | | |
| 0.00, | 7TH HIGHEST VALUE IS | 0.00000 AT (| 0.00, | 0.00, |
| 0.00, | 0.00) | | | |
| 0.00, | 8TH HIGHEST VALUE IS | 0.00000 AT (| 0.00, | 0.00, |
| 0.00, | 0.00) | | | |
| 0.00, | 9TH HIGHEST VALUE IS | 0.00000 AT (| 0.00, | 0.00, |
| 0.00, | 0.00) | | | |
| 0.00, | 10TH HIGHEST VALUE IS | 0.00000 AT (| 0.00, | 0.00, |
| 0.00, | 0.00) | | | |

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 02035 *** *** Blue Lake Class I X/Q Modeling
*** 02/07/06 *** CL1XQ01
*** 17:53:46
**MODELOPTs:
PAGE 10
CONC RURAL ELEV DFAULT

*** Message Summary : ISCST3 Model Execution ***

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)
A Total of 0 Warning Message(s)
A Total of 3148 Informational Message(s)

A Total of 3148 Calm Hours Identified

***** FATAL ERROR MESSAGES *****
*** NONE ***

***** WARNING MESSAGES *****
*** NONE ***

*** ISCST3 Finishes Successfully ***

APPENDIX E
HRA Results

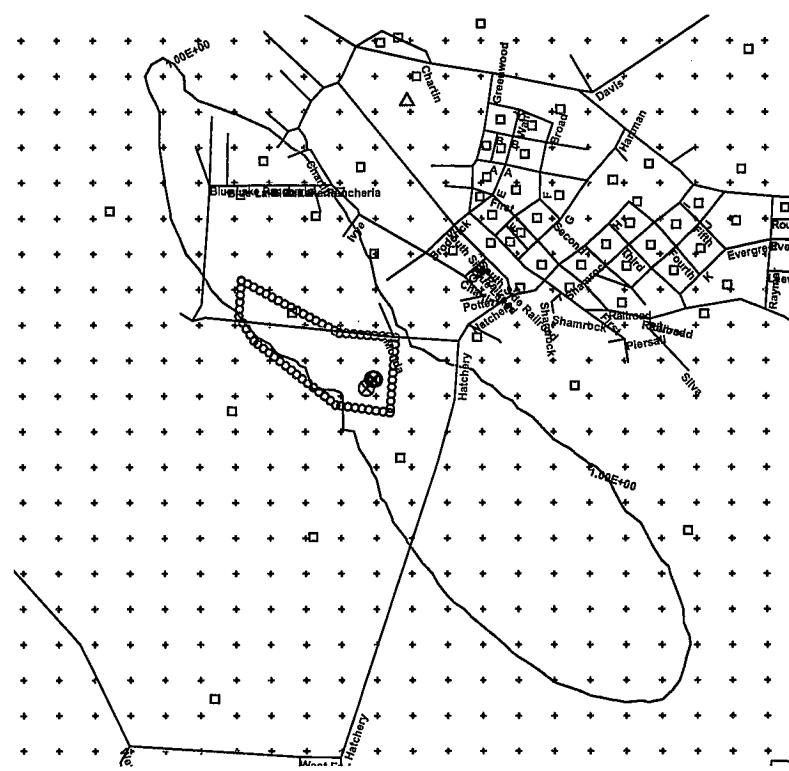
APPENDIX E.1
HARP Modeling Files

Appendix E.1 List of HARP Modeling Files

| File Name | File Description |
|-------------------|---|
| BLAK0004.asc | Blue Lake Rancheria 2000 - 2004 meteorological data |
| Cancer_Pop*.txt | HARP cancer burden calculations file |
| Export_7Feb06.tra | ATIR data exported from HARP |
| Rep_Acu*.txt | HARP acute risk output file |
| Rep_Can*.txt | HARP cancer risk output file |
| Rep_Chrt*.txt | HARP chronic risk output file |
| Rep_PMI*.txt | HARP summary of predicted maximum impacts |
| Rur_Res.sit | HARP site-specific risk parameters input file (Residential) |
| Rur_Work.sit | HARP site-specific risk parameters input file (Worker) |
| ULT3_00.err | ISC error messages |
| ULT3_00.inp | HARP ISC input file |
| ULT3_00.isc | HARP ISC workbook file |
| ULT3_00.out | HARP ISC output file |
| ULT3_00.plt | ISC plot output file |
| ULT3_00.rsk | HARP point estimate risk values output file |
| ULT3_00.src | HARP source receptor output file |
| ULT3_00.xoq | ISC X/Q output file |

APPENDIX E.2
HARP Modeling Figures

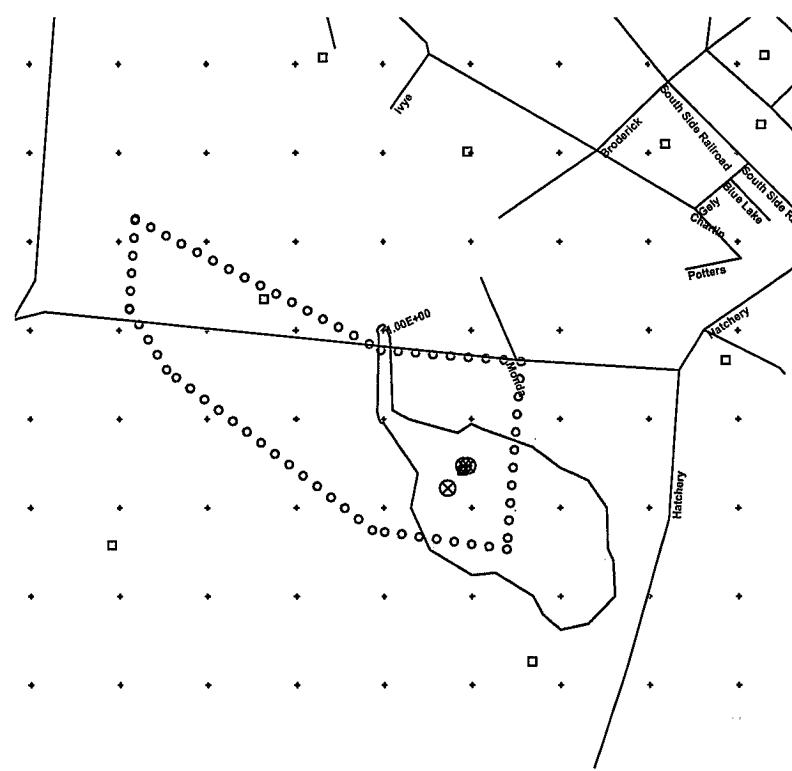
Residential Cancer Risk



Maximum Offsite Impact: 25.8 in one million at 416244E, 4525605N (Facility Boundary SE of engine stacks)

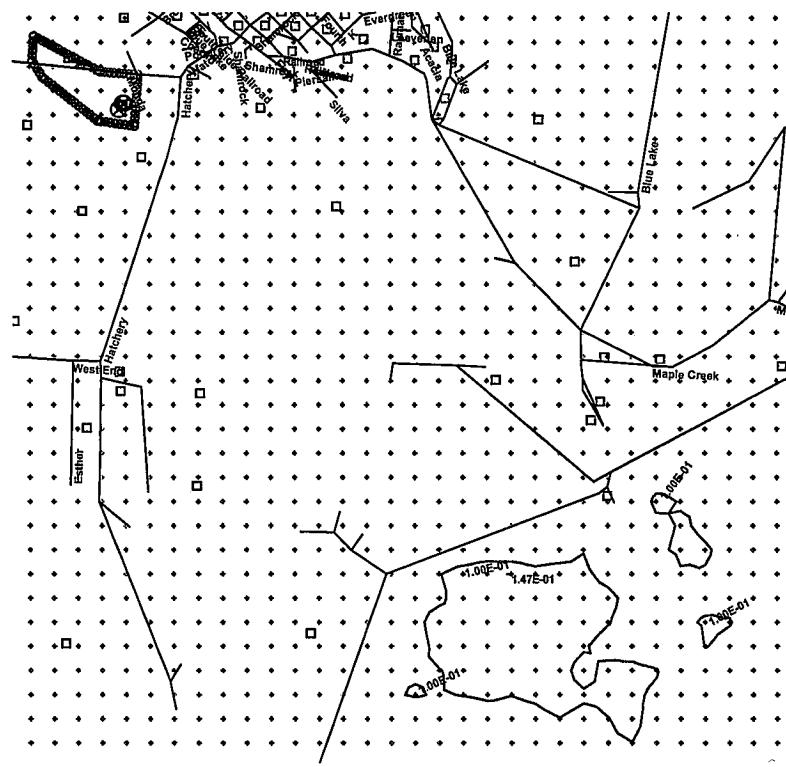
Maximum Residential Impact: 1.94 in one million at 415900E, 4526100N (540 meters NNE of engine stacks)

Worker Cancer Risk



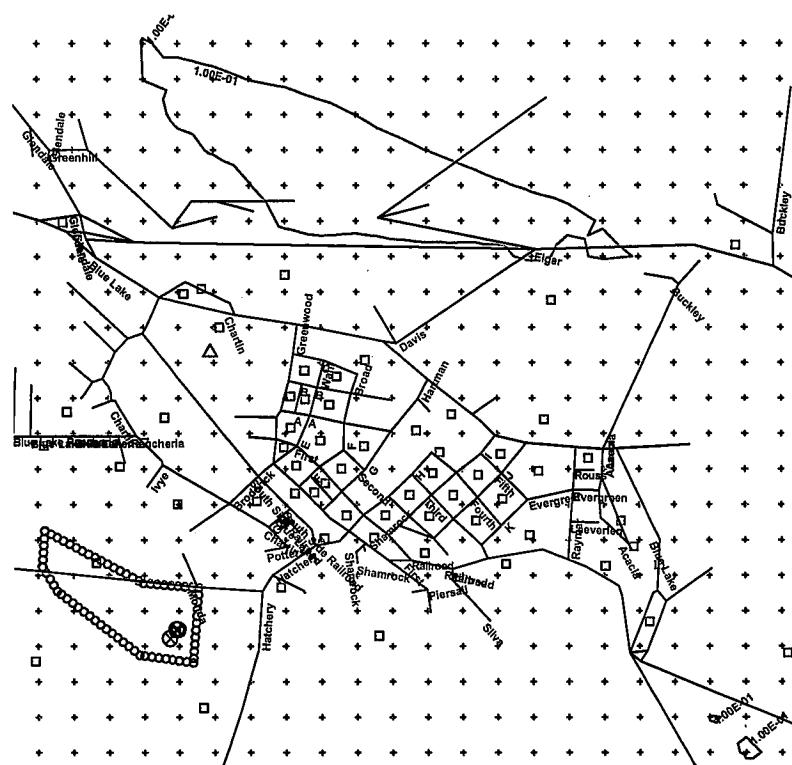
Maximum Worker Impact: 5.08 in one million at 416244E, 4525605N (Facility Boundary SE of engine stacks)

Residential/Worker Chronic Hazard Index



Maximum Offsite Impact: 0.147 Hazard Index at 417800E, 4523700N (2,500 meters SE of electrostatic precipitator stack)

Residential/Worker Acute Hazard Index



Maximum Offsite Impact: 0.148 Hazard Index at 416600E, 4526800N (1,250 meters NNE of electrostatic precipitator stack)